JOB REDESIGN : A CRITICAL ANALYSIS

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ABSTRACT

The thesis examines four central propositions of theories of job redesign: i) job redesign has abandoned major tenets of scientific management, ii) job redesign affects job attitudes and behaviour via intrinsic motivation, iii) job attitudes and behaviour are both influenced by job content and co-vary, and iv) job redesign caters for the mutual interests of workers and employers. These propositions are critically examined firstly through a comparison of the three classical job redesign theories - Herzberg's job enrichment, task design theory, and sociotechnical systems theory - with scientific management, following which a new theory of job redesign is proposed. This postulates affinities between job redesign and scientific management; attributes performance improvements after job redesign to extrinsic mechanisms (pay, control, labour elimination, methods improvements) for all but a minority of employees; postulates attitude - behaviour discrepancies; and claims significant economic costs for workers because of job redesign such as intensification of labour and loss of jobs. The classical and the new theories are tested against cases in the literature, and against original case material, and the new theory found to have greater explanatory power (of the origin mechanisms, and consequences of job redesign) despite a number of methodological and conceptual shortcomings. These shortcomings slightly weaken the value of the theory, but it remains worthy of further testing and refinement. Finally, a number of implications of the new theory are drawn out, for the history of management practices, for the future of job redesign, and for general models of worker behaviour, and further research projects are suggested.

CONTENTS

Tables and Figures

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"The understandings of the greater part of men are necessarily formed by their ordinary employments. The man whose whole life is spent in performing a few simple operations .....has no occasion to exert his understanding, or to exercise his invention ..... He naturally loses therefore the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become." (Adam Smith[1])

"Manufacture ..... converts the labourer into a crippled monstrosity, by forcing his detail dexterity at the expense of a world of productive capabilities and instincts; ....." (Karl Marx[2])

"Every day he repeats the same movements with monstrous regularity ..... He is no longer anything but an inert piece of machinery, only an external force set going which always moves in the same direction and in the same way." (Emile Durkhiem[3])

Part One

INTRODUCTION

CHAPTER 1 INTRODUCTION

The effects of specialisation of manual labour have been the objects of comment and criticism for almost two hundred years, as shown by the quotations on the previous page, which cover the period from 1776 to 1902. The solutions proposed by these three writers were very different: Adam Smith recommended a modicum of education to compensate for the narrowness of industrial work; Marx argued for the overthrow of the capitalist mode of production and for the development of society's productive forces under socialism, as the preconditions for the abolition of division of labour; Durkheim called for the integration of the worker into the group of workers to which he nominally belonged, so that he might then perceive the significance of his own fractional task.

The concern of this thesis however is a more recent critique of specialisation of labour, which has been known variously as job enrichment, enlargement, structuring, or design [4]. The central argument of these various 'schools' consists of the view that the organisation of work on the basis of what are taken to be scientific management principles, such as extreme specialisation of labour, is becoming counter-productive and is resulting in consequences such as absenteeism, dissatisfaction, turnover of labour, low productivity, industrial conflict, and even sabotage.[5] However, the

situation can be remedied by reversing the division of labour and enlarging, or enriching jobs. Not only will this improve satisfaction, and hence reduce absenteeism and turnover, it will also enhance productivity since employees will perform at improved levels on jobs that are intrinsically interesting and motivating.

In view of the widespread acceptance of division of labour as an economic necessity, and its existence in some of the industrial countries, for several centuries, it is clearly important to examine very carefully claims regarding its negative consequences, and suggestions for their amelioration. Whereas earlier critiques, such as those quoted from above, have tended to counterpose workers' psychological interests to economic imperatives, the contemporary critics have argued it is possible to reconcile the two sets of demands. This unusual claim further increases the interest of the proposals.

Such proposals can be traced back to two sets of studies in the late 1940s. The famous study of the car assembly line by Walker & Guest argued that job dissatisfaction could be ameliorated by increasing the scope of individual jobs so that workers could enjoy enhanced variety and autonomy.[6] At the same time Walker reported one of the earliest experiments in 'job enlargement' in a large machine shop, where several different work roles were amalgamated.[7] The second major study, by Trist et al, established 'autonomous' work groups in the Durham coal mines within which workers were deployed

on various jobs as required.[8] Such groups were established as part of a socio-technical approach to work organisations.

The next major innovation in this field was Herzberg's two-factor theory of job attitudes, in which the causes of job satisfaction and motivation were located in job content (rather than context)[9]. Hence to improve these factors, jobs should be 'enriched' to provide employees with responsibility, a sense of achievement, personal growth, and recognition.

Each of these approaches - job enlargement, socio-technical theory, and job enrichment - continues to be influential even today, with Herzberg's job enrichment having exerted perhaps the greatest influence, at least on industrial psychology and management theory.[10] The more well-known cases of job redesign include those at Volvo[11], ICI[12], Philips[13], and AT & T[14].

Yet despite the long history of criticism and discussion of division of labour, contemporary writers in the job redesign field have scarcely examined the relationship between their own work and ideas and those of their predecessors. Indeed, certain themes have been taken for granted, most notably the claim to have superceded scientific management. The other omission in this literature, again surprising in view of the persistence and pervasiveness of division of labour, is a willingness to adopt a scientifically sceptical attitude towards some of its now orthodox claims. As many writers and commentators have observed, this field of work has been characterised by a remarkable degree of evangelism

and partisanship, which seems to have prevented more serious and sober assessments of what has actually been achieved. Such assessments are now beginning to emerge, in articles and books by writers such as Cummings and Molloy, for instance[15]. The thrust of their work however is largely methodological, and concerned with the design and evaluation of changes in division of labour. The present thesis is principally concerned with a theoretical examination of job redesign, that is both critical and comprehensive. Critical, in the sense of being sceptical of received or conventional wisdoms, and comprehensive, insofar as it aims to encompass the origins, mechanisms and consequences of the redesign of jobs.

At the present time, a work that rectifies the omissions noted above, and which meets the criteria mentioned in the previous paragraph, does not exist, and it is hoped the present work goes some way towards meeting these needs. The main thrust of this work will be to reject the validity of the classical job redesign theories for all but a minority of cases, and to replace them with a more adequate theory. What it will do is to examine, both theoretically and empirically, a number of central propositions of job redesign theory. The designation of such propositions as central is, of course, an over-simplification since there are several 'theories' of job redesign, and their propositions are not all held in common. These theories include those of "job enlargement" (Guest), "job enrichment" (Herzberg), sociotechnical systems

(Trist et al), and the work of Hackman et al., which is rather difficult to classify. Despite their variety it is possible in my view, to isolate four central, or core, propositions:

(1) All the theories have as their strategy a reversal of the division of labour, i.e. they advocate de-specialisation, and this process, it is argued, can result in economic and psychological benefits. Hence, it is proposed, by implication (and sometimes explicitly) that the traditional benefits of specialisation can no longer be guaranteed. More generally, it has been argued that major tenets of scientific management have been invalidated and rendered obsolete by job redesign[16].

(2) The process of de-specialisation yields these benefits because employees are more highly motivated to perform tasks that are 'richer' in variety, autonomy, responsibility etc. Redesign, in other words, enhances task-centred, or intrinsic, motivation, as compared to scientific management which focussed on rewards such as pay, that were extrinsic to the job itself.

(3) Increased performance by employees is associated with, caused by, or leads to, increased job satisfaction and 'improved' attitudes to the job.

(4) The process of despecialisation benefits both workers and employers simultaneously - workers gain more satisfaction from the performance of their new tasks, whilst employers gain higher productivity and quality, and perhaps lower absenteeism and turnover.[17]

These propositions are central, I would argue, because they encapsulate the origins, the processes, or mechanisms, and the outcomes of job redesign. Absent from the list are propositions dealing either with the circumstances in which job redesign might be applied, or with the effects of individual, psychological differences on the processes and outcomes of redesign. These latter issues will in fact be discussed, as will others referred to earlier in this Introduction, but they do not form the principal concerns of the thesis, partly because the available evidence is so inadequate, and limits the conclusions that might be drawn.

Job redesign, scientific management and specialisation of labour.

The significance of the reaction against scientific management and specialisation of labour can be judged by examining the work of prominent writers in the field of job redesign. According to Guest:

"Basically, job enlargement is an attempt to reverse the trend begun many years ago with the spread of mass production, increased specialisation of labour, the growth of more complex business organisations and the influence of the theory of scientific

management begun a half century ago by Frederick Taylor and carried on by Gilbreth and others."[18]

In 1955 Davis, Canter & Hoffman published a report on methods of job design in industry which confirmed the continued salience of specialisation of labour and the reliance on reduction of immediate production costs as a criterion determining job design decisions.[19] But with the expansion of job redesign in the 1960s and '70s, Davis & Taylor were writing in 1972, of "discontinuities" in job design philosophies, and of the emergence of new values supporting job design initiatives.[20] Herzberg too sought to distinguish the tenets and assumptions of his two-factor theory of job attitudes from industry's prevailing conceptions of man, and he traced the latter back as far as Taylorism, with its stress on control, training, and incentives.[21] Hackman & Lawler, proponents of the 'Job Characteristic Model' of motivation, have also commented on the way in which scientific management "simplified, specialised, standardised and routinised" jobs,[22] and similar views can be found in many articles and case studies of job redesign.[23] Finally, the sociotechnical school of theorists have explicitly argued that their development of 'autonomous work groups' contradicts some of the most cherished principles of scientific management.[24]

In other words, one can find in the job redesign literature a recurrent theme composed of the view that redesign, as a managerial strategy, is contrary to scientific management principles, so one can thus speak of a discontinuity in managerial practice.

In the thesis I shall attempt to explore this theme in more depth, and one of the first questions that will be asked is whether job redesign theorists have in fact understood the principles and practice of scientific management. I shall also consider whether they have improperly conflated two developments which are in fact quite discrete, namely specialisation of labour and scientific management. Examination of this question will therefore require a detailed reconstruction of Taylor's theory and practice rather than reliance on the usual secondhand sources. This work will be directed at the first core proposition of the classical theories, but it is also intimately connected with the mechanisms of motivation posited in the second proposition. For Taylor advanced a series of views on worker motivation and performance whose influence can still be found in management theory and industrial sociology, although they are at variance with those of classical job redesign theory.

It may however be asked why I have chosen to compare job redesign only with scientific management, and specifically, why there is to be no comparison with 'human relations' theory. After all, a number of writers, including Herzberg, have argued that job redesign also poses a challenge to human relations neglect of work itself as a source of satisfaction[25]. The reasons for my own neglect of human relations theory (apart from the usual limitations of space and time) are two-fold : first of all, human relations theory has not figured so prominently as a pole of opposition in job redesign writings

compared with scientific management; but secondly, and more importantly, it is more meaningful to compare scientific management with redesign of jobs because the two movements have a number of common concerns. Both have focussed on the organisation of production and the division of labour; and both have entailed fairly clear conceptions of the sources of worker motivation as well as satisfaction. Human relations theory, on the other hand, has made no specific contribution to the organisation of production per se, and it has not always been clear whether its contribution was directed to worker satisfaction, or whether it also covered motivation. For these reasons then, human relations theory will not be considered in this work. That is not, of course, to say that a comparison of job redesign and human relations would be without interest: on the contrary, there is certainly room for a study assessing the degree to which individual job enlargement, for instance, has abandoned some of the insights of the human relations school into social aspects of production.

Intrinsic motivation

Perhaps the clearest illustration of what is meant by the term 'intrinsic motivation' comes from Herzberg. In his book Motivation to Work he asked a sample of engineers and accountants to describe occasions at work when they felt particularly good or bad, and to elaborate both the circumstances and the meaning of these occasions. Many comments on meaning referred to 'psychological rewards' such as feelings of

achievement, recognition, improved status, responsibility etc., whilst descriptions of the circumstances associated with these, and other rewards, tended to focus on job-related features such as advancement, or recognition. Circumstances associated with bad feelings, and with lower motivation tended to centre around features such as pay, supervision, and company policy. According to Herzberg then, performance could be increased by redesigning jobs so that they generated rewarding and motivating psychological experiences.

For scientific management job performance was a function both of abilities, and of incentives and controls. More generally, in manufacturing, it was also a function of the level of technical organisation of the productive system. As Vroom & Deci point out the underlying theory of motivation here rests on a "rather substantial foundation of psychological research and theory"[26]. Although it does, as they also point out, have limitations. The 'carrot and stick' approach to motivation also has a long history within management, and despite the upswing in popularity of the behavioural sciences that occurred in the 1960s, it is by no means clear that the attachment to more traditional concepts of motivation underwent a corresponding and, inverse, decline. This emphasis on pay and control can be traced back at least as far as Marx, but more recently it has been restated by Baldamus, who has argued that the wage-effort bargain lies at the heart of employer-worker relations and of administrative controls within the organisation[27].

The point to be made here about the emphasis on intrinsic motivation is that it poses a challenge to more traditional, managerial beliefs, as well as to some contemporary industrial sociology, both of which stress the significance of pay and controls as factors strongly related to performance and satisfaction within the organisation. And of the four propositions of job redesign theory, this one is by far the most significant, since the others are either derived from it, or are relatively independent of it. It will be argued, however, that the emphasis on intrinsic motivation is misplaced, and that several of the outcomes of job redesign cases can more adequately be explained in terms of 'traditional' pay and control methods.

Job performance and job attitudes

Despite the persistent failure of industrial psychologists to discover a high, positive, and general correlation between job performance and job attitudes, such as job satisfaction, job redesign theorists have tended towards the view that such a relationship does exist. Guest, in 1957, described several case studies in what he called job enlargement, and he presented the results in terms of economic benefits for the companies concerned, such as improved product or service quality, or higher productivity, and psychological benefits for their employees, such as improved attitudes, increased satisfaction or reduced absenteeism[28]. In other words, a relationship was posited between job performance and job attitudes. A few years later Herzberg advanced a similar

argument[29], whilst sociotechnical systems theorists have long held to much the same point of view. The joint optimisation of social and technical systems can improve performance as well as creating more satisfying work roles[30].

In numerous case studies the same theme has recurred, and it has now been enshrined in a standard mode of case presentation, adopted by British, American, and international institutions[31]. The results of these cases are presented under two headings - economic results and human results, and the content of these categories conforms to the examples given above. The link between performance and attitudes has thus become part of the 'official' theory of redesign of jobs. And finally, we should notice that the most recent theory, or model (Hackman & Lawler's job characteristics model) in this field, again incorporates the view that attitudes and performance are linked via job content : improved job content will improve <u>both</u> of these features.

The job redesign literature is consistent on this theme, for one can also find numerous assertions to the effect that specialised, monotonous jobs generate both attitudinal consequences (job dissatisfaction) as well as behavioural outcomes (absenteeism, turnover, low productivity etc).

The difficulty with the notion that job performance and job attitudes are positively correlated is, as implied above, that it appears to be at odds with the available evidence from industrial psychology.

I say <u>appears</u> to be so for two reasons: firstly, since about 1968 a considerable literature has emerged on individual

differences in job attitudes, which suggests, amongst other things, that one can distinguish population subgroups on the basis of their attitudes to extrinsic and intrinsic rewards at work. So for example, it has been shown by various researchers that lower status, urban, blue collar workers with less attachment to 'the Protestant work ethic,' tend to be more concerned with securing extrinsic rewards at work, and less concerned about intrinsic rewards, such as having a challenging or interesting job, as compared to their higher status, rural, white collar counterparts[32]. Thus performance and job attitudes may not be related for many of the former category of workers - they may perform well for extrinsic rewards and still dislike their jobs, whilst a positive attitude - performance correlation may exist only for the latter category of workers, thought by some writers to constitute a minority of the workforce. The second reason for exercising caution over the contrast between the findings of industrial psychology in general, and job redesign, is that a number of industrial psychologists have, in recent years, attempted to argue that attitudes and performance do correlate, but only under certain conditions, and for certain types of people. So for instance, it has been suggested that an attitude - performance link can be found for employees high in job-related abilities, who can exercise control over their levels of performance, and who value the rewards of high performance[33]. Few such qualifications have been made by theorists of job redesign, and they have also tended to remain rather unaware of the evidence in industrial psychology suggesting that overall job satisfaction may be a complex function of attitudes to

many features of the industrial (or office) environment.

Once again, the fact that job redesign theory and practice challenges a fairly orthodox view within industrial psychology gives it a significance and a degree of relevance that extends beyond the confines of the job redesign area.

The mutual interests of workers and employers

The notion that job redesign permits the mutual satisfaction of the interests of workers and employers follows in fact from the idea that job performance and job attitudes are positively correlated, and that both improve after job redesign. For if this is the case, then the employees obtain psychological rewards accruing from the performance of more intrinsically motivating jobs, whilst their performance also yields economic benefits for the employer in the way of improved productivity or improved product quality. The theme, like others to be examined in this thesis, has been rendered most explicit by Herzberg, in 'The Motivation to Work ,' but it can also be found in other writers.

The chief problem with this argument is that the notion of mutual benefits cannot be properly assessed until we have considered both the benefits as well as the costs of job redesign, and until we have also examined the economic gains and losses for workers as well as for employers. Although the evidence provided in many case studies does not allow either a very adequate or an unequivocal assessment of these additional costs and benefits, it does nevertheless permit us to draw some preliminary and tentative conclusions and to suggest that a number of economic costs of job redesign

(for workers) have been seriously underestimated.

* * * * *

The alternative theory of job redesign to be developed and examined in this thesis will challenge the classical theories on each of these four propositions: It will argue that there are affinities between job redesign theory and practice, and scientific management; that an elaborated version of the extrinsic motivational mechanisms of Taylor can offer a superior account of job redesign outcomes; that job attitudes and behaviour are analytically dissociated; and that job redesign entails hitherto neglected costs for workers.

This argument has implications not only for the classical theories of job redesign, but also, as I have indicated throughout for a number of areas in industrial psychology, such as motivation theory[34]. Going further afield it may also have implications for work in related fields such as worker participation and industrial democracy[35], studies of alienation and job characteristics[36], managerial ideologies[37], and division of labour[38].

Conversely, a number of closely rotated phenomena have been excluded from consideration, in particular job rotation[39], and group technology[40]. Characteristically, the former has been introduced to alleviate boredom or dissatisfaction, and the latter to improve product throughput and cut work in progress via the reorganisation of layout.

Neither, generally speaking, has concentrated on the simultaneous improvement of job attitudes and job performance, a feature which is one of the hallmarks of job redesign.

Research methods

In order to examine the four central propositions outlined and discussed above, the thesis employs three principal methods: the first is a comparison of the theories, and in some cases, the practices, of job redesign and scientific management; the second is a secondary analysis of over seventy cases of job redesign, and a comparison of their results against predictions derived from classical redesign theories, and from my own theory to be outlined in Chapter 5; and the third method is the case study approach, in which both the central propositions, described above, as well as a number of ancillary propositions, are explored through particular cases of job redesign in which I was involved. Let us first discuss each of these methods in turn, before outlining the structure of the thesis.

The comparison between scientific management and job redesign is intended to provide a tentative assessment of the first of our four propositions cited above, and the rationale for the choice of scientific management has already been explained. The second and third methods - a literature review, and case studies - are intended to be complementary, since each in isolation has its weaknesses. The literature

review can be used to highlight trends and tendencies which seem to be operative across a range of cases, e.g. it may suggest, as we shall argue, that there is a positive relationship between the use of pay incentives and the existence of productivity increases. As such, the literature review is a necessary adjunct to the case study, which may reveal, for instance, the significance of pay incentives in a particular case, but can tell us nothing about their more general significance across a range of cases.

Each of these latter methods does have certain weaknesses and limitations which must be acknowledged. The literature review is limited by the reliability and validity of the data reported in the case studies on which it is based, and more will be said about this data in Chapter 6. The case study too has its drawbacks: in the cases to be described in the thesis severe constraints were placed on the kinds of data available for collection, as a result of which the cases can at best be taken as illustrating the possible validity of certain arguments, rather than furnishing strong proof or disproof. A number of the cases contain no original, attitudinal data and this has both limited the range of propositions to which the cases are pertinent, as well as having compelled the author to make inferences about the meanings and causes of behaviour, that are, at the very least, debatable. More generally, the case study can only suggest hypotheses about processes or mechanisms - it cannot tell us anything about their general applicability, and for this latter information

we require a more comprehensive review of cases. The absence of a single case study combining valid and reliable attitudinal and behavioural data collected at different points in time is clearly to be regretted, but it is a circumstance attributable, in some degree, to the difficulties of an individual researcher trying to secure access to a severely limited number of companies, some of whom are averse to publicity, in the face of intense competition from institutional research teams in the universities and in government. This is no doubt a familiar refrain in industrial work, but it is true nevertheless.

Structure of the thesis

The thesis as a whole is divided into five parts. In this, the first part, the main intention was to describe the field of job redesign in very broad terms, and to delineate the central propositions that are to be examined in depth. The second part of the thesis begins this process at the level of theory, and by successively investigating Taylorism and contemporary theories of job redesign, it aims to lay the foundations for a more adequate theory, described in Chapter 5. In Part3 this new theory is applied both to existing cases in the literature, as well as to a number of original case studies. The Discussion in Part 4 concentrates first of all on some of the problems of the new theory, which were revealed in Part 3, and then proceeds to discuss some of its broader implications. Part 5 summarises all of the main conclusions from the thesis.

This general structure of the thesis also follows the

sequence of central propositions of classical job redesign theories outlined above. In other words, it begins with the theoretical and historical origins of job redesign in the work of Taylor in Part 2. Part 3 concentrates on the second, third and fourth propositions relating to mechanisms of motivation and job performance, the job attitudes - performance link, and the consequences of job redesign (the mutual benefits thesis). The correspondence between this structure and the propositions is not exact: mechanisms of motivation and performance are also discussed in Part 2, for instance. But even the approximate correspondence which does exist will hopefully make the reading of the thesis a somewhat easier process.

The detailed structure of the thesis chapters is basically as follows: Chapter 2 is devoted to a study and reconstruction of scientific management through the writings of its founder, F.W. Taylor. It seeks to demonstrate that the scope of Taylorism is wider than has often been acknowledged, especially by his critics, and that his ideas are more coherent than the usual division between his organisational and technical contributions would suggest. It is also argued that because Taylor's writings are relatively scant, a number of his ideas on such themes as motivation, remained in an underdeveloped state, and that if these are taken into consideration, in conjunction with an appreciation of the way in which his ideas changed and developed, one can obtain a much fuller and more accurate picture of the theory (and, it will be argued, the practice) of scientific management. The detail provided in

this chapter is necessary, I believe, if we are to evaluate the relationship between job redesign and scientific management, and to construct a more adequate theory of job redesign. For to do this we must first ensure that we fully understand scientific management, and not be content with using second-hand sources of information.

Chapters 3 and 4 contain presentations and discussions of three principal theories, or models, of job redesign: task design and dimensions theory, Herzberg's job enrichment, and sociotechnical systems theory. The first of these theories is, to some degree, an amalgam of the work of Guest, and Hackman and Oldham, and is less clearly defined than the other two. Each of these discussions aims firstly, to present the main features of the theories in question and their development over time; secondly, to try and articulate some of their underlying assumptions; and thirdly, to draw out some of their deficiencies and problems, i.e. to reveal issues to which a more adequate theory should direct some attention. Each of these discussions also refers at times to cases and experiments that were intimately connected with the formulation of the theory in question.

It should be noted that each of these chapters contains a considerable wealth of detail on a variety of themes. This detail in necessary, in my view, to the extent that a number of serious and fundamental criticisms will be made of these theories, and it is therefore incumbent on me to show their justification, but hopefully the mass of detail will not entirely obscure the four central propositions under discussion throughout the thesis as a whole.

Chapter 4 also compares the theories of job redesign and scientific management on a number of dimensions and issues, and attempts a more precise formulation of their relationship, at a general, and theoretical level. It thus goes some way to assessing the validity of the first proposition described in the Introduction.

The principal object of Chapter 5 is to formulate a new theory of job redesign which can encompass the conclusions drawn in Chapter 4, as well as the problems noted with the existing theories. Before engaging directly in this endeavour two possible sources of insights are first explored: criticisms of job redesign from those concerned with workers' interests, such as trade unionists and radicals, and theoretical criticisms from more academic writers. Some of the insights in this literature are used in order to articulate a theory of job redesign which offers alternative accounts and explanations for each of the four propositions outlined in the Introduction. This new theory actually consists not of four, but of six, statements. Two of these cover the first classical proposition, on the origins of job redesign; the next three map directly onto the remaining three propositions; whilst the final statement offers a general characterisation of job redesign as a phenomenon.

The next four chapters (6 - 10) examine the applicability of the theory to four sets of case studies and experiments. The first three sets are taken from the existing literature, and each chapter aims to compare the explanatory power of the

new and the classical theories of job redesign for a particular category of redesign. These analyses relate mainly to the classical propositions on motivational mechanisms, and the attitude-performance link, although there are also discussions of the relationship between job redesign practice and scientific management. Chapter 9 presents three original case studies, one in each of the three categories of job redesign. The Meccano case is reported first of all because it is the most detailed. This case is particularly relevant to propositions about job redesign-scientific management, and about motivation. The Dairy case study is relevant to the mutual interests thesis, which has hitherto received little attention, and to questions concerning the future of job redesign which are taken up in Chapter 12. Finally, the United Glass case examines a neglected feature of the origins of job redesign, namely differences in managerial attitudes, and relates these to discussions about job redesign and labour specialisation. Finally, in this part of the thesis Chapter 10 examines the costs and benefits of job redesign for the parties involved.

The two penultimate chapters (11 and 12) explore some of the problems and limitations of the arguments contained in the thesis, and in particular those relating to the concepts of effort, intensity, and motivation. Chapter 12 also addresses itself to some of the assumptions underlying the new and the classical theories of job redesign, as well as exploring a number of broader issues, such as the history of management practices, and the future of job redesign. The final chapter (13) summarises the conclusions of the thesis as a whole.

NOTES AND REFERENCES

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3. Durkheim, E. 1964, p. 371.

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5. cf. Andreatta, H. 1974. Chap. 1; Birchall, D. 1975, p. 24; Hackman, J.R. Lawler III, E.E. In Davis, L.E. & Taylor, J.C. 1972, p.p. 141-2; Herzberg, F. In Davis & Taylor, 1972, pp. 116-7. Herrick, N. & Maccoby, M. In Davis, L.E. & Cherns, A.B. 1975, p.p. 67-8; Pierce, J.L. & Dunham, R.B. 1976; Taylor, L.K. 1976, Preface.

6. Walker, C.R. & Guest, R.H. 1952.

7. Walker, C.R. 1950; also, Drucker, P. 1968 (orig.ed.1955), Chap. 19, and Guest, R.H., op. cit.

8. Trist, E. et al. 1963; Rice, A.K. 1958.

9. Herzberg, F. et al. 1959.

10. Herzberg, op. cit. (1959), pp. 133-34.

11. Lindholm, R. & Norstedt, J.P. 1975. For more popular accounts of Volvo see Anon. Job enrichment: experiments in work re-organisation at Volvo. 1974; Baker, C. 1974; Gibson, C.H. 1973; Ruehl, G. 1974; Willatt, N. 1973.

12. Paul, W.P. & Robertson, K.B. 1970.

13. See Philips, 1969, den Hertog, 1974.

14. Ford, R.N. 1969.

15. Cummings, T.G. & Molloy, E.S. (1977).

16. See note 5.

17. Each of these propositions is documented in more detail below.

18. Guest, R.H. 1957, pp. 9-10.

19. Davis, L.E., Canter, R.R. & Hoffman, J. In Davis & Taylor, 1972.

20. Davis & Taylor, 1972 pp. 111, 154-74.

21. Herzberg, F. 1966, Chap. 3.

22. Hackman, J.R. & Lawler III, E.E. in Davis & Taylor, 1972, p. 141.

23. e.g. Jessup, G. 1974; Dickson, P., 1977; Jenkins, D. 1974.

24. cf. Trist, in Weir, 1976 B.

25. Herzberg, F. et al. 1959, pp 126-8. Sociotechnical theorists have argued similarly, that whilst human relations looked only at the 'social aspects' of work, and Taylorism only at its 'technical' aspects, their own theory integrates these two approaches. cf. Emery (1959).

26. Vroom, V.H. & Deci, E.L. 1970, p. 13.

27. Baldamus, W. 1961.

28. Guest, R.H. (1957).

29. Herzberg, (1959). p.ix.

30. cf. Trist, E.L. & Bamforth, K. 1951.

31. See International Labour Organisation, 1977; Work in America, 1972.

32. cf. Hulin, C.L. & Blood, M.R. 1968; Turner, A.N. & Lawrence, P.R. 1965.

33. cf. Tiffin & McCormick, 1975, Chap. 12.

34. cf. Vroom, V.H. 1964; Miner, J.B. & Dachler, H.P. 1973.

35. Clarke, R.O. 1972. Globerson, A. 1970; Walker, K. 1968; Wall, T.D. & Lischeron, J. 1977; Guest, D. & Fatchett, D. 1974; Blumberg, P. 1968; Ottoway, R.N. 1977; Pateman, C. 1970.

36. Eg. Emery, F.E. 1959. Also Gardell, B. and Susman, G. both in Davis & Cherns, 1975. Walton, R.E. 1972; Work in America 1972. On the classical, Marxist conception of alienation see Ollman, B. 1971; and for industrial studies see Blauner, 1964, and criticisms in Eldridge 1971, and Gallie, 1978.

37. Bendix, R. 1956; Child, 1969.

38. Braverman, H. 1974, Davis, L.E. et al. 1955. Thorsrud, 1972. Trist, E.L. 1976.

39. cf. Clack, G. 1967, Chap. B; Nichols, T. & Beynon, H. 1977, p. 133 ff.

40. cf. Edwards, G.A. 1971;
Hall, P.D. Feb. 1975; Spooner, P. 1973.

Part Two

THEORETICAL DEVELOPMENT

CHAPTER 2 THE THEORY AND PRACTICE OF TAYLOR'S SCIENTIFIC MANAGEMENT *

Introduction : Misconceptions of Taylorism

Scientific management, the system of management devised by F.W. Taylor has recently begun to re-emerge as a subject of debate in academic circles. Many theorists allied to the various schools of job redesign have commented unfavourably on the fragmentation of industrial and clerical tasks, a process which they attribute to the theory and practice of Taylor. Thus, for example, the official summary report of the Swedish experiments in job redesign (which included the famous Saab and Volvo cases) under a heading called "Taylor's mistakes" went on to discuss the deleterious psychological effects of task specialisation and fragmentation (the terms seem to be used interchangeably)[1]. Peter Drucker, one of the most widely read management theorists wrote about these 'mistakes,' or 'blind spots' as he called them, twenty five years ago.

* The following editions of Taylor's works have been used throughout this essay, and the titles of each have been abbreviated, as shown, for the sake of convenience.

Notes on Belting (NB))
A Piece Rate System (PRS)) in Two Papers on Scientific Management. London, Routledge, 1919

Shop Management (SM)
Principles of Scientific Management (PSM)
Testimony before the House Committee (THC)
- all in Scientific Management. New York, Harper, 1947

On the Art of Cutting Metals (ACM) New York, ASME, 1906

> "The first of these blind spots is the belief that because we must analyse work into its simplest constituent motions we must also organise it as a series of individual motions, each if possible carried out by an individual worker ..... This is false logic. It confuses a principle of analysis with a principle of action." [2]

He then went on to discuss approvingly the early experiments in "job enlargement" at IBM and at Sears-Roebuck.

The official British organisation responsible for job redesign in this country has also echoed similar sentiments to those of its Swedish colleagues. Here, for instance, is a remark by its Director, Gilbert Jessup:

> "Jobs, even today, are designed primarily according to the principles of scientific management as laid down by Frederick Taylor during the early part of this century. This is to say that complex operations such as building a car or assembling a T.V. set are broken down into numerous small tasks each of which can be performed by relatively unskilled labour with the minimum of training." 3

If we descend from the institutional to the individual level we can find further examples of this belief in the connection between specialisation of labour and Taylorism. I have already quoted from Guest, an exponent of job enlargement, on this connection (see Introduction), but the idea can also be found in the writings of Herzberg,[4] and of Trist,[5] both of whom are principal representatives of two major schools of job redesign, job enrichment and sociotechnical systems theory respectively. And finally, the theme can be found expressed in many case studies of job redesign, such as those of Hackman & Lawler,[6] in individual articles,[7] and in textbooks covering broader topics such as Organisation Development, e.g. French & Bell.[8]

This, however, is only one of a number of misconceptions of Taylorism that are to be found in the literature of job redesign and industrial psychology. There also exists the view that Taylor had no conception of the social dimension of the workplace[9], a view reiterated by Aitken, the author of a full length study of Taylorism[10]; or the view that Taylorism consisted solely or essentially, of time and motion study, an opinion reinforced by the famous remark of Taylor's in which he describes the study of unit times as ".....by far the most important element in scientific management." (S M, p. 58)[11].

Other misconceptions include the ideas that Taylorism consisted principally of an effort to exert managerial control over labour,[12] or that he held derogatory views of workers and that under scientific management workers were reduced to the status of automata, and were considered too stupid to grasp the subleties of 'science.'[13]

Finally there is the idea that for Taylor, worker motivation was a question which reduced itself, essentially, to the issue of pay. Indeed this theme has been enshrined in the shorthand term 'rational-economic man' which is generally considered as the beginning and end of Taylor's thought on motivation at work.[14]

It should be said finally that it is not only Taylor's critics who have misconceptions about scientific management. Folker, an industrial engineer, argued that Taylor's principles are now outdated, and were suitable only for situations where

exploitation was accepted[15]. More recently, Drucker has written a eulogy for Taylorism whose tone contrasts sharply with what he wrote twenty five years ago[16]. Taylor, he now says, "anticipated practically all of the later research of the Human Relations School or of Frederick Herzberg." Whilst Drucker's attempt to correct misinterpretations of Taylor is commendable, his reconstructed Taylor seems as far from the reality as do many of the views we have outlined above. Much of his quotation and argument is taken from Taylor's Testimony before the House Committee, and since this was, in part, a public relations 'exercise' presenting Taylorism in a favourable light, the Testimony, though nevertheless a valid and important document, needs to be approached with rather more circumspection than is to be found in Drucker's 'new' account of Taylor.

Each of these ideas about Taylorism can be shown to be misconceived either because they are empirically incorrect, or because they have overlooked some of the contradictions and developments within Taylorism, or because they have emphasised only certain aspects of Taylorism and ignored others. And we can discover both errors of omission and of commission.

This chapter then will fall into two parts: the first will consist of a brief 'reconstruction' of the principal features of scientific management, whilst the second will explore in more depth some of the misconceptions that I have identified, and in particular those relating to motivation, division of labour, and individualism and social influences. Neither of

these endeavours is in fact as straightforward as may at first appear since, as I shall try to show, Taylor's ideas developed and changed over time, and his work as a whole is not always consistent. Further, he expressed a variety of ideas which remained in an under-developed state throughout his writings, and an appreciation of his work must also consider the existence and significance of such ideas.

The focus of this chapter will be the theory and practice of scientific management or Taylorism (the terms will be used here interchangeably despite the somewhat broader connotations of the former) as evinced principally in the writings of Taylor himself. Since many job redesign writers have attributed various (usually undesirable) characteristics to Taylorism, it is important to establish their veracity as part of, and prelude to, a more comprehensive appraisal of current job redesign. It will be taken as given that Taylorism has been misunderstood, and our focus will thus be on the nature and implications of these misconceptions, rather than on their determinants or processes interesting though these may undoubtedly be.

The Origins and Substance of Scientific Management

Taylor began his career as a labourer at the Midvale Steel Works and after a short spell as a clerk, returned to the shopfloor as a machinist[17]. He remained in this job only a few months before he was promoted to gang boss, and it wasn't long before he was again promoted - to machine shop foreman. It was during this brief period

'on the shop floor' that he made a number of observations which were to be crucial in the development of his system of management. First of all he located the inability of managements to raise labour productivity in their ignorance of the times in which particular jobs could, and ought to, be done; secondly, he became aware of the existence of and the rationale for, output restriction by workers; and thirdly, he came to believe that existing payment systems did not provide sufficient incentive for workers to raise output.

Unlike some of his contemporaries, and indeed descendants, Taylor did not continue to regard output restriction as 'irrational' but endeavoured to find its causes. In describing output restriction he used the term 'soldiering' and distinguished two types: 'natural' soldiering which was apparently innate, and 'systematic soldiering' which

> ".....results from a careful study on the part of the workmen of what they think will promote their best interests." 18

The cause of this latter (which Taylor considered to be more serious) lay in the fact that the employers did not know, and had no means of ascertaining the extent to which it was possible to raise output, and this deficiency was based, in its turn on a,

> ".....profound ignorance of employers and their foremen as to the time in which various kinds of work should be done.....". 19

There existed then no 'rational' basis for allocating given quantities of work over a certain time period, and employers were thus compelled to depend on the goodwill of their workforce in responding to wage incentives, and on their own cunning in cutting piece rates and hence their labour costs whenever there was a transitory, upward, drift in productivity. The workers in their turn soon learned the costs of raising their output, such as higher workloads and reduced manning levels and thus organised 'restrictive' practices. Once rate cutting had been experienced several times, and restriction of output regularly practised, there developed, on the basis of these experiences, a more generalised feeling of antagonism between worker and employer[20].

Taylor thus developed what we may call a socio-historical theory of output restriction which turned on the economic relations between employers and workers, the accumulated and generalised experiences of workers, and the inevitable ineffectiveness of 'ordinary' systems of management arising from managerial ignorance of the shortest possible work times[21].

The fundamental novelty of Taylorism was that it entirely rejected the approach of 'ordinary management', which linked pay to <u>current</u> levels of output,[22] but sought instead to determine what levels of performance were physically <u>possible</u>, and to link pay to <u>these</u>, rather than to existing or previous levels. Managements had little or no conception of these levels, and even if the workmen did (and Taylor always remained ambivalent on this point), it was in their direct interests to conceal the fact. The only consequence of disclosing their

knowledge would be a reduction in piece rates, thereby compelling them to work harder for the same pay as before. But if output could be raised substantially (and Taylor believed, initially on the basis of his own experience, that it could) then a number of benefits would accrue, the chief of which was that the workmen could receive higher wages, at the same time as their employers achieved lower labour costs. Both sides could then,

> ".....take their eyes off the division of the surplus as the all important matter, and together turn their attention towards increasing the size of the surplus....." 23

The basis for this transformation of industrial relations rested on the willingness of workers to raise output in exchange for guaranteed higher earnings, and on the displacement of surplus workers following this increase in output.

At the most abstract level Taylor's answer to the lack of knowledge about work times was striking in its simplicity: he proposed the application of the methods of science to the arena of industry. In particular, he proposed to measure what workmen actually did, according to times taken, and to develop from that basis,

> ".....this one best method and best implement can only be discovered or developed through a scientific study and analysis of all of the methods and implements in use,..... This involves the gradual substitution of science for rule of thumb....." 24

The measurement of work was not peculiar to scientific management[25] but as Taylor pointed out, earlier time studies were neither systematic nor detailed[26]. The Midvale Steel Works, at which Taylor was employed, certainly held records of the times in which various different jobs had been completed, but were these the fastest possible times? And were they based on the most efficient methods? Taylor was convinced that neither was the case, and he, therefore, began systematic time studies of Midvale workers.

In order to answer his questions, he employed two principles: firstly, in timing any job, he began by analysing it into constituent, or elementary motions; and secondly, he sought the quickest time in which the job could be done, as he thought, consistently and "without harm or injury to the workmen."[27] This work was carried out by the Rate-Fixing Department, and as the name implies, its primary function was to measure and prescribe worker performance, and to set levels of incentive pay to induce it. As Taylor discovered, however, there was more to rate-fixing than the assignment of workloads and pay incentives. In the production systems where he carried out much of his early work, products were manufactured, shaped etc., on individual machines, and the condition of the machinery was often a crucial factor affecting the workers' possible output. If it broke down, for instance, was the worker to be penalised for lost production? or the employer? or both of them? So, in 1895 then, Taylor wrote that,

> ".....the Rate-Fixing Dept. has shown the necessity of carefully systematising all of the small details in the running of each shop; such as the care of belting, the proper shape for cutting tools, and the dressing, grinding and issuing same, oiling machines, issuing orders for work, obtaining accurate labour and material returns, and a host of other minor methods and processes. These details, which are usually regarded as of comparatively small importance, are shown by the Rate-Fixing Dept. to be of paramount importance in obtaining the maximum output....." 28

This was the case, both because defects in machinery prevented workers attaining their 'maximum' output, and also of course, because they reduced the efficiency of the machinery itself. Taylor's studies of machinery, as in his 1893 paper on belting, which originally formed just one part of the application of science to production soon became an integral part of Taylor's work[29].

This <u>systemic</u> character of scientific management is frequently overlooked, and it is not uncommon for it to be regarded as little more than time study, and wage incentives. Taylor's 'technical' developments are either treated as interesting by-products of his main work[30], or else ignored altogether[31]. Yet these twin aspects of Taylorism, which we may call the 'social' and the 'technical' are interconnected in several ways. Both stem from the desire to apply scientific method to industrial production, and both have as their common objective, "the cutting down of time to the minimum consistent with good work."[32] And finally, as Taylor argued (above), the application of time study and wage incentives in themselves would be insufficient to realise

the greatest possible gains in productivity, unless one also standardised the conditions in the shop to facilitate uninterrupted production.

By 1895, the time of his first important paper, a number of major features of his system were already clear. He had argued for the necessity of a separate Department to engage in time and motion study and to fix wage rates and had developed what he called the Differential Piece Rate System. Under this system a rate of pay was set for a standard level of output, which only 'first class' men would be likely to attain. The worker who fell short of this standard, if only by a small amount, received a proportionately greater cut in pay, whilst the worker who exceeded the standard received a proportionately greater rise in earnings[33]. And finally, he had argued that the problem of raising productivity required an investigation of machinery, as well as of men. This was the state of Taylor's 'art' or science in 1895; over the next 16 years a number of points were to be added, and there would be several changes of emphasis, which we shall briefly mention.

In 1903 he produced a very detailed paper entitled 'Shop Management,' in which he extended some of his earlier observations. The worker was now to be assigned a daily quota of work by management, and to ensure he performed it, a variety of 'functional foremen' would attend to different aspects of his work. The emphasis on the payment system and on time and motion study as the fundamental tools of

management in the pursuit of higher productivity, were thoroughly overhauled and increased stress placed on the role of supervision and assignment of work quotas, and on organisation more generally.[34]

The transformation in this book, as compared to previous, and to subsequent works, is striking[35], and later developments in Taylor's thought took the form of changes of emphasis rather than radically new departures or insights. Although the importance of pay, and of the construction of payment systems was downgraded in this book, there were nevertheless, detailed recommendations on wages.

Further indication of the importance of organisation is revealed by the changed name of the Rate-Fixing Dept. - this had now become the Planning Dept., responsible for all the major details of the shop. It will be recalled that Taylor had commenced experiments on machinery at the same time as he began his time and motion studies at the Midvale Steel Works, but the most efficient running and standardisation of the machinery was now an integral part of the management of the whole shop. For if the workmen were to achieve a high level of performance in response to the incentive of higher pay and under the direction of the Planning Dept. and the foremen, it was necessary to ensure that they were provided with the means to work efficiently and without interruption.

Thus it was that Taylor undertook to overhaul and to standardise the tools and machinery of the shop, and to set

up a special stores dept., responsible for the issuing of tools. Equally, it was necessary to ensure the workman knew exactly what he had to do each day and how he was to go about doing it. For this Taylor developed firstly, a branch of management whose duty was to train the workforce in the new methods, and secondly, a branch of the Planning Dept. whose role it was to issue instruction cards each day to the workmen. At the same time the other departments of the workshop and other sections of the workmen would be issued with routing cards instructing them where to obtain and despatch materials. These cards served also to create a smooth and continuous flow of materials through the shop so the workmen could proceed to work without interruption throughout the whole day.

These developments marked the culmination of the development of "scientific management." What began as a search for ways of raising output through the study of labour finally resulted in a complete system of management comprising the elements described above.

Of Taylor's later publications, 'The Art of Cutting Metals' was read to the ASME in 1906 and contains many of the themes which were fully elaborated in 'Shop Management.' There were, however, a number of changes of emphasis. The notion of the task idea, that is, the daily allocation to each workman of a certain amount of work, was accorded even more prominence than previously, and nor was this merely because it illustrated the exactitude of scientific management[36]. The

daily assignment of labour had become both the means by which management planned and monitored its production, as well as the means whereby the workman was able to calculate his earnings and adjust his effort accordingly. For the latter, in other words, it was a form of feedback. Secondly, the centrality of the payment system was once more downgraded as was illustrated by the facts that very little attention was devoted to its description, and the Differential Piece Rate, Taylor's own payment system, was not mentioned at all.

Thirdly, there was a far greater emphasis on the importance of the slide rule, as developed by Carl Barth, for use in determining the cutting speeds and feed rates of a machine for a given series of parameters of a piece of metal. By 1906 Taylor had come to regard it as the quintessential expression of the substitution of science for tradition and rule of thumb. But not only did it signify the supersession of tradition, it also marked a far more significant process. For 'tradition' and 'science' were seen to be represented by social groups - tradition by the workmen, science by the management, and the replacement of one by the other therefore indicated the successful outcome of a power struggle[37]. Taylor himself never used the term 'power' but the descriptions of his first and early attempts to raise output, in the Midvale Steel Works, testify to his intuitive understanding of the realities of power.

A further development appeared in 'The Principles of Scientific Management,' in which Taylor not only expounded the by-now familiar details of soldiering, time and motion

studies, functional foremen etc., and described the well known case studies, such as Schmidt on pig iron shovelling, but where he also developed his ideas on the fourth principle of scientific management - the'co-operation' between management and workmen. As we have seen, Taylor had long ago evolved the material basis of this co-operation in the form of a constantly growing mass of wealth in which both workmen and employers could receive ever larger amounts of wages and of profits. But this in itself was inadequate, for not only had there to exist some basis for co-operation, but workmen and employers had to overthrow their acquired beliefs and perceive there was such a basis. Such was the 'mental revolution' described by Taylor, and when describing it to the House Committee in 1912 Taylor referred to it as the "essence" of scientific management, and sought to distinguish it from the "mechanisms" such as time and motion study, and pay incentives[38].

We have now sketched a brief historical outline of the development of Taylorism, and it has hopefully become clear that Taylor's thought did develop and that ideas were elaborated and amended throughout his life.

Summary

Let us now, therefore, try and summarise the major features of Taylorism, in its most developed form. At the most abstract level we can say that it involved an attempt to replace traditional methods of organisation, with methods determined by 'scientific' inquiry, and subjected to 'scientific' test.

The problem of low, or restricted, output was seen in terms of the poor operation of all the features of a production system - labour, machinery, workflow, etc., and Taylor's innovations affected such diverse subjects as motor belt widths and tension, machine maintenance, work methods, division of manual labour, planning of materials flow, tools storage and standardisation, workloads, supervision, and payment levels, and systems, as part of a systemic approach to organisation.

Taylor thus raised productivity both by increasing workloads, via incentives and supervisory controls, and by the employment of more efficient methods of production and working.

His more detailed mechanisms included time and motion study, enhancement of the division between execution and conception, careful selection and training of workers, and specification of workloads and work methods for individual workers.

The more abstract features of Taylorism however, such as his systematic approach, or his advocacy of 'science' can no longer be identified as specifically Taylorist ideas since they are common to almost all approaches to organisations and to production. But we can say (and the point is argued in more detail elsewhere) that the use of the more specific mechanisms identified above is compatible with, and constitutive of, Taylorism.

What we shall do now is to focus in more detail on specific aspects of Taylorism, and deepen the discussion that has already taken place. In this ensuing section we shall also enter into more detail over some of the debates about Taylorism, and take up some of the misconceptions referred to in the Introduction.

The Question of Motivation

According to the standard histories of the subject, Taylor held a rational-econonic view of worker motivation in which the workman, responding to the incentive of money, would rationally evaluate the strategies open to him in order to maximise his income at minimum cost. The view was articulated most clearly in Taylor's discussions of soldiering where he argued that the phenomenon represented a collective form of defence against rate cutting. We have noted, however, that over a period of time the importance of the payment system was lessened in Taylor's mind, and was complemented by a series of additional measures, notably the task idea. Indeed, at one stage scientific management was referred to as 'task management.'

The allocation of a daily quota of work was necessary from the point of view of the Planning Dept, so that production could be planned at least one day in advance, and all arrangements made, in terms of tools, machinery etc. From the workmen's point of view the daily task was a way of telling him what he had to achieve in order to earn the standard rate of pay, and was in that sense no different from any other piece rate system. But although introduced for this

specific purpose, Taylor came to see that there were further advantages in this assignment.

> "There is no question that the average individual accomplishes the most when he either gives himself, or someone else assigns him, a definite task, namely, a given amount of work which he must do within a given time; ....." 39

Here, admittedly in embryonic form, we can see the elements of a theory of motivation which has now been fully articulated into the goal-setting theory of Locke and his associates.[40] The setting of a goal, which is attainable, yet not too easily so, is seen by this group as a central feature of worker motivation.

Again, at the end of the day the workman would be informed (or would know) what he had achieved, and so the task assignment would also

> ".....furnish(es) the workman with a clear cut standard, by which he can throughout the day measure his own progress and the accomplishment of which affords him the greatest satisfaction." 41

Of course, PSM was a popular work, written at a time of intense union hostility to scientific management, and its content must therefore be seen as partly reflecting the pressure on Taylor to vindicate his work and to present it in the best possible light. Nevertheless, one can find references to the importance of feedback (as we would now call it) in task performance both in his earlier works, and in his correspondence, facts which suggest the quotation above does reflect predominantly a genuine aspect of scientific management rather than any desire to placate hostility. And once begun, task performance had

its intrinsic motivation. Where repetitive work was being done:

> "The higher pressure of the differential rate is the stimulant required by the workman to maintain a high rate of speed and secure high wages while he has the steady swing that belongs to work which is repeated over and over again." 42

Like many aspects of Taylor's thought, this observation of the rhythm in repetitive work, an observation which anticipates the important work of Baldamus on the same subject[43], remained underdeveloped. This was partly because there were, as he thought more important factors in motivation, but also because he himself did not in fact devote much time to the repetitive kind of work mentioned here.

With the development of the idea of functional foremen, notably in 'Shop Management,'and the consequent proliferation of foremen, charge-hands etc., that were to be found in the ideal scientific management shop, it was not long before Taylor considered the relations between workmen and their superiors. Again this was a feature of his system to which he devoted little attention except insofar as he repeatedly stressed the vital necessity for 'co-operation' between workmen and employers in order to maximise output, and hence increase wages and profits. But what were the consequences of this imperative for daily shop floor relations? In the light of his experiences of the extent to which workers were prepared to struggle in order to resist productivity increases, he believed that loss of production could be drastically reduced as follows:

> ".....if the superintendents are reasonable men and listen to and treat with respect what their men have to say, there is absolutely no reason for labour unions and strikes." 44

Hence superintendents too had a role in motivating the workforce to maintain high performance.

He also made much of the fact, particularly in his Testimony, that under scientific management a whole range of new jobs were created in the Planning Dept., such as the various clerks and foremen, and that promotion opportunities for shop floor workers were, therefore, increased. As evidence of the reality of these openings he claimed that of a certain category of machinists at the Bethlehem Steel Works, 95% had started with the company as yard labourers.[45] Under scientific management they had been raised to the highest kind of work of which they were capable, a process which Taylor claimed was one of the objects of his system. It is not clear, however, whether this promotion was to be valued for anything other than its financial rewards, for if not, then it simply conforms to Taylor's generally hedonistic view of workers. Finally, we should not forget the social influences on production which Taylor encountered at Midvale, and elsewhere under the guise of the organised restriction of output. Co-operation between the workers themselves was thus seen as counter-productive, whereas the co-operation proposed by Taylor, between the workers and their superiors, was thought to be an ingredient in the promotion of productivity.

The role of pay was, nevertheless, vital. Even when a daily task was assigned and feedback given, and when all the

prerequisites for production had been arranged by the Planning Dept., e.g. the proper tools, materials, route cards etc., and the job supervised by the foremen, all of this would be to no avail unless a proper rate of pay was given. There were, contrary to popular opinion, two main reasons for the centrality of pay. The first was the classic view of worker motivation rightly attributed to Taylor, in which money was seen as the major inducement that could be offered in return for higher effort. There was, however, a second reason, equally as important as the hedonistic character of workmen. Taylor remarked on numerous occasions that men ".....would not do an extraordinary day's work for an ordinary day's pay." [46] Within the exchange relationship between capital and labour such an arrangement would have been categorically rejected by the workers as an injustice. The just treatment of the workforce was necessary both to secure their willing co-operation in the introduction of scientific management, but also (and this was a view stressed in his later works) to help bring about the "mental revolution" which comprised the "essence" of it.

This brings us to the final component of Taylor's view of motivation. As we have seen, the "mental revolution" constituted, in part, a recognition of the material basis for a commonality of interest between worker and employer. The use of the term "mental revolution" was no mere public relations exercise to ward off hostile comment for its ingredients are to be found even in "A Piece Rate System," written in 1895, where he spoke of "the proper mental attitude" on the part

of the workforce in the form of "friendly feeling" rather than antagonism.[47] This fact suggests that whilst trade union hostility may have stimulated Taylor to develop this aspect of his theory, it did not 'implant' as it were, anything which was not already present, albeit in latent form. When we also consider the relative diminution in the significance of the choice of payment system throughout Taylor's later works, then we may suggest, on the basis of these facts, that Taylor's earlier view of labour motivation- a classic cash-nexus model- was complemented in his later years by a vision of relatively 'unalienated' workers deriving satisfaction and motivation from their co-operation with management. This is not to say that the cash nexus model disappeared, but only that Taylor's mature view combined both cash-nexus and more sophisticated notions of motivation in a somewhat uneasy alliance. Job redesign theorists have largely ignored this later development and treated Taylorism as a homogeneous body of ideas based solely around the 'cash-nexus.'

Specialisation and Division of Labour

During the 1912 U.S. Government investigation into Scientific Management, the Chairman, William Wilson asked:

> "Is not one of the elements of scientific management this possibility to divide it up so that the workmen will have the same operation to perform over and over again?" 48

In this question is expressed the major criticism of scientific management from the standpoint of the worker (there is a second item - the intensification of labour - which we

shall discuss below). Scientific management, according to many writers, constitutes almost a qualitative transformation in the division of labour, as a result of which the worker is reduced to a condition in which he exercises little skill, and then, only at the discretion of the management. As we saw in the Introduction such a view is held by writers such as Drucker, Lindholm and Jessup.[49]

The notion that Taylorism entails or necessitates specialisation of labour rests on three different arguments: (i) that Taylor did, in practice, specialise three groups of workers - bricklayers, machinists, and supervisors; (ii) that he sought to demarcate conception and execution; (iii) that in his account of time and motion study, Taylor insisted on the need to break down work into its smallest components.

There is some confusion over the terms specialisation and fragmentation of tasks, particularly since the former has been used to describe the emergence of occupational divisions as well as intra-task divisions. Since, however, Taylor worked almost exclusively with employees far below the level that would be considered as specialist, we shall confine our discussion solely to the proposition that Taylor advanced division of labour per se.

The first of the three arguments in favour of this proposition is that Taylor did in practice specialise three categories of worker - machinists, supervisors and bricklayers. Although there is an empirical defect with the argument - to

which we shall return shortly - its principal defect is a logical one: the fact that Taylor carried out specialisation of labour does not tell us whether such specialisation is an integral or a necessary feature of scientific management. It does not tell us, in other words, whether Taylorism is the cause of this specialisation, or whether there might be other causes which lie outside of, or which pre-date, Taylorism.

In fact extensive division of labour was already quite common in those industries which had felt the force of the Industrial Revolution, such as engineering, cotton and weaving. Its prevalance had been attributed by Adam Smith to improvements in speed and dexterity of working, to elimination or reduction of job changing, and to discoveries of method improvements, all of which were consequent upon extended labour division.[50] And Charles Babbage later pointed out that division of labour also allowed the reduction of labour costs as skills were divided and thus cheapened.[51]

Taylor replied to the House Committee question on specialisation of labour (cited above) by making precisely these points:

> " Mr. Taylor. Under scientific management precisely the same principles of work are used in that respect as under the other types of management.....under scientific management, or any other management, the manufacture of shoes is divided into very, very, many minute parts.....each one performed by a different man in a well-run shop.
> .....this is what takes place under the older types of management, and that undoubtedly would continue under scientific management;.....
> I think this tendency to training toward specialising the work is true of all managements, for the reason that a man becomes more productive when working at his speciality,....." 52

Taylor therefore dissociated specialisation and scientific management, by pointing to the existence of specialisation elsewhere, and to the benefits already reaped from the principle (as adumbrated by Smith).

The second point to notice about the empirical argument on Taylorism and specialisation is that it actually overlooks significant features of the cases on which it is supposedly based. In the example of the machinists, it is true that Taylor removed certain parts of their job, such as fetching supplies and removing finished goods, and assigned them to other workers, thus leaving the machinists free to continue with the most skilled parts of their work.[53] In addition he also codified the knowledge of the machinists and attempted to regulate their work in accordance with the principles thus discovered. Equally, in the case of the bricklayers (who were actually studied by Gilbreth, although Taylor thoroughly approved of the work done) the preparatory work of mixing the appropriate grade of mortar, and of laying out the bricks ready for immediate use by the bricklayer, were both separated off and assigned to the skilled worker's assistants.[54] In both cases this process was conceptualised by contemporaries as well as by more recent writers, as one of specialisation: the range and level of skills exercised by a worker were reduced.

It is important to notice, however, that this conclusion is one which reflects a particular view of the process that took place, the view of the skilled workers. From their standpoint, skills and activities were removed from their

jobs and transferred either to un/semi-skilled workers, or to new technical and managerial staff. And the public debate that occurred in the U.S.A. in the early part of this century, over scientific management, also reflected this concern with the job of the skilled worker, involving, as it did, the American Federation of Labour, a largely craft-based union federation.[55]

Yet whilst the perspective, and fate, of the skilled worker is important, one must recognise that other workers were involved in the processes described as specialisation, and from their point of view, the processes, in fact, looked rather different. In the bricklaying example, ordinary labourers were assigned the task of sorting out the bricks, and of laying them out, ready for use. Mortar mixers were given the responsibility of tempering the mortar so that bricks could be laid with the minimum effort.[56] And in the machinists' example, Taylor noted the benefits which accrued from separating off the tasks of minor repair and maintenance and assigning them to day labourers.[57] In both of these cases, we can see that a process of specialisation, viewed from one standpoint, appears as <u>de</u>specialisation viewed from another. Of course we cannot say that one view is 'true' as against the other, for these two views merely represent two aspects, or phases, of a single process, the transfer of work from one group of workers to another. But the revelation of this dual aspect of the process shows up the one-sidedness of the empirical evidence linking scientific management with specialisation of labour.

Thirdly, on this first argument, let us consider the case of foremen, for in this instance Taylor clearly and unambiguously recommended the division of their labour into a series of segmented roles - gang boss, speed boss, route clerk, time and cost clerk etc. Although Taylor was aware that by so doing he could obtain the same work with cheaper labour[58] the extensiveness of specialisation in this case was tied to a specific, and peculiar, feature of their work. This was the tremendous increase in the number and range of duties which Taylor assigned to management and which arose out of his analysis of the need for planning, regulation and measurement of all aspects of production.[59] Partly because of this, Taylor argued that suitably qualified labour would be almost impossible to obtain, and only specialisation of the foreman's role would allow companies to find, and to hire, suitable employees. The recognition that this process of specialisation would permit the hiring of cheaper labour, or the payment of lower wages, was derived ultimately from Babbage, but as we have already indicated such a recognition can accomodate the despecialisation of lower grade workers at the same time that it requires the specialisation of more skilled workers.

Finally, on this first argument, it should be pointed out that in two cases in which he was involved, those of ball bearing inspection, and pig iron shovelling,[60] Taylor did not introduce any further subdivision of labour even though this would have been possible, for example along product lines. This throws further doubt, therefore, on the notion that

labour specialisation was an integral or a necessary feature of Taylorism.

The second argument sometimes made in favour of this proposition is that Taylor sought to demarcate conception and execution, or 'planning' and 'doing.' The truth of this proposition hardly requires documentation, and it was given its most pointed expression in 'The Art of Cutting Metals:' where Taylor spoke of the necessity,

> "of taking the control of the machine shop out of the hands of the many workmen, and placing it completely in the hands of the management." 61

This indeed is one of the features for which Taylorism has become so well known.

It is pertinent to observe here, as was done elsewhere in a different context, that much of the conceptual labour that was to be divided from executive work was in fact new work, previously not carried out by any group of workers. Time and motion study, and systematic planning and routing of materials are the best examples here. A considerable body of work remains however, and much of this has to do with the codification and systematisation of work already performed within the shop. This knowledge was gathered up and, as Taylor put it, placed in the hands of management, in the form of charts and slide rules thus facilitating their control over production.

But there is a fallacy involved in the argument that this codification of knowledge and its placement in the hands of management entails specialisation. Several writers have argued that Taylor transferred knowledge from workers to

management, impoverishing the former, and strengthening the latter. This view is untenable though because it has a false conception of knowledge. It rests on the assumption that knowledge is a kind of commodity which can be 'taken' from workers and 'given' to management, but in reality the situation is quite different. Even if management, through scientific investigation, accumulates knowledge of production which enables it to revise work norms and methods, the workers in production still possess the knowledge they have accumulated through training and experience. What changes in the situation is not the possession of knowledge, but its monopoly.

Let us turn now to the final argument on Taylorism and specialisation. Drucker was quoted in the Introduction to this Chapter as saying that one of Taylor's mistakes was to confuse a principle of analysis with a principle of action, i.e. that as well as subdividing jobs for analysis he also did this in practice.[62] We have examined already the evidence on Taylor's practice, so we shall focus here on his analysis of jobs. The most complete description of the method of conducting time and motion studies is to be found in 'Shop Management.' In that book Taylor described, how and why, for purposes of analysis, one should subdivide work into elementary units. The reasons were twofold: first of all by timing very short and quick movements Taylor thought that possible sources of error and interruption would be minimised, and the whole procedure be rendered more efficient;[63] secondly, an analysis of work methods would show that some of the

motions made were superfluous, and these could be discarded in the calculation of the final time for the job.[64] That Taylor did not intend these elementary motions of work to be the bases of new, specialised jobs is clear from the example which he uses, that of shovelling. Time study, he said, should measure separately the actions of filling the shovel, and of throwing off the contents.[65] Presumably these elementary motions were not to be performed by two different workers!

It is not Taylor then who has confused a principle of analysis with a principle of action, but a number of his critics.

Having now examined each of the three arguments in support of the link between Taylorism and labour specialisation, there is just one further, and final, point that can be made. Taylor did discuss the issue of specialisation and acknowledged the possibility that jobs might be despecialised under his system of management:

> ".....When a number of miscellaneous jobs have to be done day after day, none of which can occupy the entire time of a man throughout the whole of a day.....In this case a number of these jobs can be grouped into a daily task which should be assigned, if practicable, to one man,....." 66

He then proceeded to give a number of examples of the kinds of work where this might be done, but of more importance than these specific instances is the fundamental principle which determined them:

> "The task should call for a large day's work, and the man should be paid more than the usual day's pay." 67

Faced with a choice between specialising labour, and assigning a 'large day's work,' Taylor preferred the latter. What this indicates about the status of specialisation within Taylorism is that it was conceived as a means, and not as an end in its own right,[68] and further, that as a means for achieving the objective of maximum labour productivity it was not always appropriate.

"The one best way....."

Humanistic critics of Taylor, concerned with his supposed disdain for the individual worker have raised, in particular, the question of work methods as a cardinal example of such violation.

According to Friedmann, a particular method of working practised by a worker may appear to contain unnecessary motions, but in fact these may have some hidden, psychological significance. In any case, practised movements constitute "organic wholes," and one cannot simply remove certain elements and leave behind others.[69] Contrary to scientific management, which imposes "one best way" of working, regardless of individual differences and preferences,

> "Industrial psychologists.....grant the worker the right and opportunity to adopt another method if he prefers it and if he can prove that it is equally efficient." (my italics). 70

But what did Taylor actually mean by "the one best way?" The 'one best way' involved the conscious study of current work methods, and the elimination of ".....false movements, slow movements and useless movements," and the subsequent collection of ".....the quickest and best movements as well

as the best implements."[71] Taylor then, rejected the assumption, and rightly so, that traditional methods of work, developed over many years, perhaps over generations, were necessarily more efficient, either in human or economic terms, than those methods devised after scientific inquiry. The major thrust of his method here, as generally was to replace tradition, by science, and to render the improvement of method a conscious process. The notion of "one best way" should not, however, be understood in a static sense.

> "This best method becomes standard, and remains standard .....until it is superseded by a quicker and better series of movements." 72

So although Taylor believed there was "one best way" to do a job, he recognised that in practice, it might not be attained. Was the worker then completely subordinate to the dictates of "science," or could he be granted some discretion on this question of work methods?

> "If after having tried the new method once any workman has a better suggestion to make, of any kind.....that suggestion is most welcome to the management." 73

The principle involved here is similar to the one advocated by Friedmann: the worker can alter his methods, if the employer loses nothing by it (Friedmann), or if the employer gains by it (Taylor). In both cases, a concession to the worker's interest was made conditional on the safety of the employer's interest, although Taylor demanded more on this count than did Friedmann. And as we shall see, the notion of 'one best way' is far from dead, even in the contemporary literature of job redesign.

Taylorism and 'individualism.'

It is often said that Taylor treated the worker as an, isolated, atomised, individual, and that he had no concept therefore, of the social character of behaviour.[74] This error of Taylor's was supposedly corrected by the emphasis in 'human relations' theory on social rewards at work, in which there was also a corresponding diminution of the significance of pay. We have seen above that Taylor did, in fact, appreciate the existence, and intensity, of social factors on production, or rather, we should say, in the restriction of production. This appreciation is the key to understanding Taylor's alleged individualism, a feature which pervades most of his work, in areas such as methods improvement, grievance handling, and work allocation.[75] Taylor's own much-quoted account of his struggle to end output restriction at Midvale bears testimony to his experience, not only of the existence of organised restriction, but of its strength, or intensity. Not only were the machinists themselves solidly opposed to any increase in output, but even workers freshly recruited to break the machinists' solidarity, quickly succumbed to pressure.[76] Taylor experienced at first hand the existence of group restriction of output whilst he was himself a machinist, since, naturally, pressure was brought to bear on him by his co-workers to restrict his output to a certain level. Such 'systematic soldiering' as Taylor later christened the phenomenon, would, in any case, have made a

great impression on Taylor because of his own Puritan background. And he was also aware of the phenomenon elsewhere in the USA:

> .....hardly a competent workman can be found in a large establishment ... who does not devote a considerable part of his time to studying just how slowly he can work and still convince his employer that he is going at a good pace." 77

And as far as the international character of the problem was concerned, he wrote, in 1911, that,

> "Underworking, that is, deliberately working slowly so as to avoid doing a full day's work, soldiering as it is called in this country, "hanging it out," as it is called in England, "ca canae," as it is called in Scotland, is almost universal in industrial establishments,....." 78

The popular notion that Taylor was unaware of the effects of social environment and social forces, an omission which provided the foundation for 'human relations' theory, is in fact misconceived. Yet we are still entitled to ask why Taylor believed that the development of the social dimension of work could only be inimical to production. Was it not possible for workers, collectively, to raise productivity, instead of restricting it, and to be paid collectively for so doing? Taylor, as is known, answered this question in the negative, since he assumed that any such system would discriminate unfairly against the more able workmen:

> "When a naturally energetic man works for a few days beside a lazy one, the logic of the situation is unanswerable. "Why should I work hard when that lazy fellow gets the same pay that I do and does only half as much work?' " 79

The result, according to Taylor, was that group working under a group payment scheme led to the adoption of a 'slow' pace of work. This conclusion is premissed on the existence of individual differences, and on the belief that workmen have some notion of a fair, or just, wage-effort bargain. The latter belief also informed Taylor's conviction that productivity could not be increased without the award of an increase in pay. Yet there remains a deficiency in Taylor's argument: for if workers could co-operate to protect their interests against rate-cutting, why could they not also co-operate to advance their earnings through equitable sharing of workloads under a system of group payment? At no point in his writings does Taylor provide an adequate reply to this contradiction.

Critique of Taylorism

Taylorism, as we have seen, has been subjected to a great variety and intensity of criticism by many writers, both past and present. It has been labelled as a principal determinant of deskilling[80] and of speed-up and intensification of labour,[81] accused of seeking to augment managerial control over labour,[82] and held to be completely ideological in character and devoid of scientific content.[83] These, and other criticisms, and particularly those emerging from the work of Braverman and Friedmann, have been examined in detail elsewhere, and the same work has also considered the conceptual bases of current and possible critiques.[84] These discussions will not therefore be repeated here, but we will summarise the

conclusions that are most pertinent to job redesign.

We have argued that some of the more common criticisms of Taylorism are difficult to justify, but the following points can be readily substantiated: firstly, Taylor did undoubtedly raise productivity in part by increasing worker levels of effort, and work pace, i.e. he intensified labour[85] (although he also improved work methods and machine maintenance and utilisation)[86]; secondly, Taylorism sought to increase managerial control over labour by the individualisation of payment levels, training , and work roles, and thus to undermine the collective organisation which he saw as inevitably hostile to managements interests; and thirdly, whilst wage increases and promotion opportunities were obtained,[87] so too were overall reductions in labour costs and volume of labour.[88]

Summary

Let us now briefly recapitulate the conclusions from the latter sections of this chapter. Although pay rises and incentives formed a central part of Taylor's motivational theory and practice, they were complemented by other mechanisms - supervisor-worker relations, goals, feedback, work rhythm, and promotion prospects - and all of the mechanisms were predicated on complete re-organisation of work methods, work flow and other features of workshops. Secondly, specialisation of labour was shown not to be an integral or a necessary feature of Taylorism, since empirically Taylor despecialised some groups of workers (and specialised others), and since the origins of specialisation both pre-dated, and lay outside of, Taylorism itself. Specialisation functioned as a means for achieving the end of increased productivity, and was not an end in itself. It was also shown that Taylor's insistence on there being 'one best way' of performing any task neither denied individual variability nor ruled out the possibility of methods improvements over time. And finally it was shown that Taylor's strong practical commitment to individualism was mainly strategic (rather than philosophical) in character.

NOTES AND REFERENCES

1. Lindholm, R. et al. 1975, pp. 45-50.

2. 1968 (orig. ed. 1955), p. 339

3. 1974, p. 1. cf.also Pugh, D. et al. 1971, p.100

4. Herzberg, F. 1966, pp. 36-67.

5. Trist E. In Weir, M. 1976.

6. Hackman, J.R. & Lawler, E.E. 1972.

7. e.g. Carpentier, J. 1974.

8. French W.L. & Bell, C.H. 1973.

9. Davies, D.R. & Shackleton, V.J. 1975, p. 17.

10. Aitken, H.J. 1960, pp. 47-48.

11. Friedmann, G. 1955, pp. 51-52; also Bell, 1972, p. 33; Sohn-Rethel, A. 1971, p. 66; 1976, p. 29; 1978.

12. Braverman, H. 1974; Davis, 1977.

13. cf. Braverman, op. cit., p. 108, and Dickson, D. 1974, p. 56; Rose, M. 1975, pp. 38, 62; and Palmer, B. 1975.

14. cf. Blackler, F. & Williams, R. 1971, p.p. 284-85; Brown, J.A.C. 1954, p. 16; Kempner, T. 1970, p.84; Silverman, D. 1970, p. 75; Warr, P.B. & Wall, T.D. 1975, pp. 26-27. To their credit Warr & Wall do begin a much needed re-evaluation of Taylorism by focussing on the significance of the task idea, and on Taylor's use of scientific methodology.

15. Folker, D.A. 1973; Scheips, D. 1972.

16. Drucker, P. 1976.

17. These, and other biographical details, are taken from the two volume biography of Taylor written by Copley, F.B. 1923.

18. SM, pp. 30-32.

19. ibid., p. 30.

20. ibid., pp. 34-35; PSM, pp. 23-24.

21. PRS, p.55.

22. PSM, pp. 30-36.

23. THC, pp. 29-30.

24. PSM, p. 25. We do not know precisely how Taylor came to develop this conviction, both in its general and in its particular forms. On a number of occasions he pointed to the gains due to science in the field of technology, and intimated that similar gains awaited its application to production.

25. Copley, op. cit. Vol. I, pp. 223-30; Urwick & Brech, 1945, Chap. 1.

26. Copley, ibid.

27. SM, p. 25; THC, p. 123.

28. PRS, p. 73

29. See also Copley, op. cit., Vol. 1, pp. 258-61; ACM, p.4; Aitken, op. cit., Chap. 3, p. 100 ff; Hoxie, op. cit., p. 22.

30. cf. Friedmann, op. cit., pp. 51-52; Kempner, op. cit., p. 76; Braverman, op. cit., p. 110. But see Nelson, D. 1975, for a more soundly-based appraisal (Chap. 4).

31. cf. Argyle, M. 1972, p. 186

32. Copley, Vol. 1, op. cit., pp. 253-54.

33. PRS, pp. 64-65.

34. Aitken, op. cit., p. 120 ff; Kakar, S, 1970, p.121; Myers, C.S. 1932, pp. 12-13, 39; Copley, op. cit., I, pp. 253-54, 358.

35. e.g. SM, pp. 27, 30-35, 62.

36. ACM, pp. 26-27

37. ibid., pp. 11-12; NB, p. 144.

38. THC. In the Testimony he referred to two aspects of the mental revolution: the first we have already described. The other aspect of the "mental revolution" was the acceptance of science. Scientific analysis was to replace not only tradition, "rule of thumb" methods, and "the management of initiative and incentive," it was also to replace custom and practice, and collective bargaining. Both employers and workmen were to be subject to the "facts" as revealed by scientific study. THC, pp. 26-27, 30, 280.
See also Nadworny, M. 1955, p. 6.

39. SM, p. 69. See also Kakar, op. cit., p. 98, for a clear statement of Taylor's theory of task motivation, contrasted with that of contemporary job redesign theories, and PSM, p. 39.

40. cf. Latham, G & Yukl, G. 1974; Locke, E. et al. 1970.

41. In other words the workman would be provided with a form of feedback or 'knowledge of results.' See Warr & Wall, op. cit., p. 26; PSM, pp. 120-121.

42. SM, p. 78

43. Baldamus, W. 1961

44. SM, p. 184.

45. THC, pp. 245-46. See also Farquahar, 1924 for the view that enhanced promotion opportunities under scientific management can, to some degree, offset the monotony of repetitive, and standardised work. Hoxie, 1915, p.93, claimed in fact, from his survey of 35 'scientific management' plants that more office workers had been promoted from the shop-floor in these plants as compared with those run under 'ordinary' systems of management.

46. e.g. PRS, p. 64.

47. PRS, pp. 68-69.

48. THC, p. 203.

49. cf. also Braverman, op. cit., and Herzberg, 1966, pp.36-7.

50. Smith, A. (1776), pp. 112-5.
The validity of his arguments has recently been challenged by Marglin, S. 1976, and both he, and other contributors to Gorz 1976, try to argue that division of labour, scientific management, and job enrichment, are predominantly different means for controlling the workforce, rather than raising productivity. Marglin however chooses to ignore the principle added by Babbage, which attempts to illustrate the cost reductions, rather than efficiency improvements, consequent on division of labour.

51. Babbage, C. 1971 (orig ed. 1835), pp. 175-6.

52. THC, pp. 203-05.

53. NB, pp. 188-89; SM, pp. 125-26

54. PSM, pp. 78-79.

55. cf. Nadworny, op. cit; Hoxie, op. cit.

56. PSM, pp. 78-79

57. SM, p. 96

58. ibid., p. 105

59. ibid, p. 94 et. ff.

60. PSM. p. 86-89, 64-72.

61. ACM, pp. 11-12.

62. See note 2.

63. SM, p. 169

64. PSM, pp. 117-18.

65. SM, pp. 168-69

66. ibid, p. 71. The possibility of 'enlargement' of jobs was in fact realised as long ago as 1923. cf. Reilly, P.J. 1923.

67. SM, p. 82.

68. For a similar view cf. Haber,S. 1964, p. 26.

69. Friedmann, 1961, pp. 52-55.

70. ibid., p. 58

71. PSM, pp. 117-18

72. ibid, p. 118

73. THC, p. 196

74. cf. Rose, op. cit., p. 39; Mouszelis, 1975, pp.84-5; Friedmann, 1961, p.366.

75. PSM, pp. 43,68-9; SM, p. 192; Copley, Vol.1, p. 177.

76. THC, pp. 82-3

77. SM, p. 33; PRS, p. 47

78. PSM, p. 13.

79. ibid, pp. 19-20

80. Braverman, 1974, and for criticism see Elger, 1977.

81. Daynon, 1973, pp. 135-7; Hoxie, 1915, pp. 169-71; Phelps-Brown, 1959, pp. 52-8.

82. e.g. Braverman, 1974.

83. Friedmann, 1961, p. 65; for criticisms see Braverman, 1974, p. 90 and Thomson, 1968, Chaps. 3, 4, 6. And for a different view, distinguishing scientific and ideological components in Taylorism see Lenin, (1918).

84. Kelly, J.E. & Wood, S.J., 1978 ; cf. also Littler, 1978, Kelly, 1978A.

85. THC, pp. 123, 184; PRS, pp. 68, 75-6; SM, pp. 43, 54, 56, 77, 78, 91; PSM, pp. 42-7. Letter to Crozier, cited in Nadworny, 1955, p. 32.

86. THC, pp. 228-30.

87. SM, pp. 54, 89; PSM, pp. 42, 99.

88. PSM, pp. 71, 95; Thomas, 1924.

CHAPTER 3 THEORIES OF JOB REDESIGN I : TASK DESIGN AND DIMENSIONS THEORY ; HERZBERG'S JOB ENRICHMENT

Introduction : on terminology

The field of job redesign is one in which there abounds a plethora of terms and theories. Numerous writers have revised, and redefined such terms as job enlargement, and job enrichment so as to accord with their own empirical findings, and/or theoretical predilections. Yet despite such revisions the field remains confused, and at least sixteen terms and concepts are currently in use as descriptions of what are ostensibly similar processes. To give just a few examples, we can find many references to : job enlargement, enrichment, extension, restructuring, design and to work re-organisation, and work structuring, in addition to 'horizontal' and 'vertical' variants of several of these terms.[1]

Three features of this terminology may be isolated for the purposes of criticism. Firstly, much of it is quite clearly evaluative, as well as descriptive: making jobs either 'richer' or 'larger' is self-evidently a 'good thing.' And not only do such terms positively evaluate the changes they denote, but they also assume in advance what has in fact to be proved. Many job redesign theorists argue that it is worker perceptions of task changes which are crucial in the generation of higher motivation and satisfaction, yet the terms describe such changes in advance as 'enrichment' etc.

More recent terminology - such as job design, work re-organisation etc. - avoids this problem by virtue of its generality but by the same token arguably fails to distinguish the supposedly novel features of the current job redesign movement from the work study-type orthodoxy which it is seeking to challenge.

Secondly, the process of change tends to be treated from a particular standpoint - that of the worker whose job is most immediately affected, and which is invariably de-specialised. Yet it will frequently be found that 'enrichment' or redesign for one group of workers involves specialisation for another. For instance where inspection, supervisory or maintenance duties are transferred to operatives, the latter experience a degree of job de-specialisation corresponding to the specialisation imposed upon the former. This, however, is only a tendency, for as we shall see socio-technical systems theory, by focussing on the level of work roles, and their re-organisation, is far more capable of embracing some of these repercussions of job redesign. Equally, it should be noted that there has been some consideration of the effects of enhanced worker autonomy on the role of the supervisor. Nevertheless the principal focus has been on the worker experiencing job redesign. The terminology currently employed then reflects a number of theoretical suppositions about the process of job redesign as I have indicated.

Thirdly, writers do not always differentiate between terms and processes, using consistent criteria. Herzberg for instance initially characterised job enrichment on the basis

of its psychological consequences - such as motivation and satisfaction but he disparaged "job enlargement" because of inadequate changes in job content - the addition of more "meaningless tasks."[2] It is difficult to see how these criteria are comparable, or to know the circumstances under which each is appropriate for use. Or again job enlargement and enrichment have often been distinguished by claiming the latter concedes elements of autonomy to workers whilst the former does not.[3] But empirically even the most 'minor' changes in job content may, as a consequence, permit the exercise of greater autonomy by workers, however unintended.

Already then we have identified a number of implicit theoretical suppositions. Let us now turn to review the major theories of job redesign. The question immediately arises here as to which theories should be included in such a review, and which work in this field should be accorded the status of a 'theory.' Is "job enlargement" for instance a "theory", or merely a set of job redesign principles? Are we to include theories of work motivation derived from, and current in, general industrial psychology, but which have figured less prominently in the field of job redesign, e.g. expectancy theory? Clearly a number of decisions, some of them arbitrary, some less so, must be made at this juncture.

Historically, two theories can be said without fear of contradiction to be major theories in this area insofar as they were derived from and/or gave rise to innovations in job redesign, namely, socio-technical systems theory, and

Herzberg's two factor theory of job attitudes, and its corollary, job enrichment. Many innovations, and many analyses of job redesign, however, cannot be located unambiguously within either of these theoretical frameworks and much of the work derived from Turner & Lawrence, exemplifies this point.[4]

It is possible to construct an overall framework within which to locate job redesign theories, using the concept of the "job." Sociotechnical theory can be said to have stemmed, initially, from a concern with the inter-relations between jobs, and their amalgamation into work roles. Herzberg's job enrichment, again, initially, focussed on the psychological structure of the job, that is on the factors connected with jobs that were associated with motivation, satisfaction and performance, such as achievement, recognition or advancement. We can also discern within the job redesign literature, a strand of work that has concentrated neither on job inter-relations, nor on the psychological consequences of job redesign, but rather on the actual structure of the job itself, and the way in which this might be conceptualised.[5] Historically, this strand has its origins in the job enlargement school, with its emphasis on task dimensions such as variety, and autonomy.

It should be stressed here that these three levels of analysis are far from being exclusive, but relate much more to the origins of theoretical currents, and to their dominant, present concerns. Thus sociotechnical theorists have laid out principles of job redesign, as has Herzberg, whilst task design theorists have considered psychological responses to changes in job content. Dominant emphases can still, nevertheless,

be discovered despite the blurring of boundaries.

This theoretical review will unfortunately exclude theories of motivation which have made only a minimal impact on job redesign. The number of such theories is legion and even a cursory review would require the addition of another chapter to the thesis.

Each of the three sections of the next two chapters has a number of common structural features, as well as a number of differences. Each section begins with a discussion of the developments of the theory in question, and looks in some detail at changes over time in the content, and assumptions of the theory. Secondly, each contains a discussion of the limitations and problems associated with the theory. Since the three theories isolated for discussion have centred on different aspects of jobs, it has not been possible to impose a uniform structure on this discussion, and the precise points that have been made reflect these differences.

A number of common problems and omissions will be taken up in more depth in Chapter 4 when we attempt a more systematic comparison and evaluation of the three theories. Equally, the majority of case studies in the literature will be reviewed in Chapters 6,7 and 8, and the next two chapters will, therefore, confine themselves to an examination of those cases most intimately associated with the formulation and development of each particular theory.

TASK DESIGN AND DIMENSIONS THEORY

Development of the theory

As I have already indicated this theory can be traced back to the job enlargement school of the 1940s and '50s. The term "job enlargement" was first coined by Walker in the late 1940s to denote a process of reversing the division of labour. The first example of such a reversal was recorded at IBM, where three work roles - those of set-up man, inspector, and machine operative - were collapsed into one.[6] Employee satisfaction and wages were higher, total labour costs reduced, and productivity higher, results which were attributed to the fact that division of manual labour was subject to diminishing returns. It should be noticed that this idea had a very specific content in the IBM case: diminishing returns did not mean, as it was to do later, increased absenteeism and turnover and lower morale, but inefficient allocation of work.[7] Much of the machine operatives' time was idle, and whilst she was idle, the set-up men were working, and vice versa. Not until the study of the assembly line, in 1952, was the idea of dissatisfaction added to the list of diminishing returns, and job enlargement (and job rotation) was advocated as a means of increasing satisfaction with work, by means of increased variety, and control over the speed of the line, that is, over the pace of work.[8] It was even thought that the enlargement of the worker's job, to encompass 5-10 operations, instead of one or two, could restore the

sense of performing a "whole" job (a term which was left suitably vague.)[9]

Over the next five years a series of studies were conducted, in offices and factories, on a somewhat ad hoc basis. As yet no consistent redesign principles had been developed, although the 1957 review by Guest did indicate a few of these, albeit indirectly.[10] All of the changes that were reported involved the addition of <u>different</u> tasks to the existing job, in other words <u>variety</u> was increased. A number also attempted to create <u>whole</u> jobs by allowing workers to perform all of the operations on a particular product. For example, one group of workers, previously subdivided into nine subgroups on different phases of product assembly, was disbanded, and individual workers each allowed to assemble the whole product.[11] The studies also involved the allocation of preparatory duties, e.g. machine set-up, mail reception, and inspection duties.[12] Subsequent studies have been conducted along very similar lines: assembly lines have been shortened, or abolished and workers allowed to assemble a larger number of components, and sometimes to check the quality of their own work. Whilst in offices, a division of labour between processes, such as mail reception, letter writing, filing etc., has been replaced by a division between groups of customers, so that, each worker now performs all of the relevant operations for a particular group of customers. These sorts of relatively a-theoretical, pragmatic changes are in fact the norm, and innovations consciously based on a particular theoretical orientation, an

in Norway. ICI, Texas Instruments etc., very much the minority, (for details of these cases, see Chps.6,7,8,).

Because this category of changes has been theorised only to a limited extent it is not surprising to find that it is quite heterogeneous. Some recent attempts have been made however to put both these and 'job enrichment' type innovations onto a firmer, conceptual basis, most notably in the work of Hackman, Lawler and Oldham.[13] Their work is based largely on the study by Turner and Lawrence, in which the authors developed and tested a checklist of job attributes (The Requisite Task Attributes Index, RTA).[14] These attributes were drawn, according to the authors, from a survey of the literature, and from their own empirical studies in a variety of organisations, and six of them were adapted by Hackman et al, these being: variety, autonomy, task identity (wholeness), feedback, dealing with others, friendship opportunities. The latter two dimensions were added for specific purposes in a particular study, and the more elaborated model has dropped them, and added one more, labelled task significance - the extent to which a task contributes to 'the lives of other people.' These dimensions were then hypothesised to lead to such outcomes as high quality work, low absenteeism and turnover, and higher job satisfaction, via what were called "critical psychological states." There are three of these: experienced meaningfulness of the work, experienced responsibility for work outcomes, and knowledge of results. Finally, the theory states that these critical states will be generated, and result in the outcomes

indicated, only for those employees with 'higher needs.'[15] The link between this work, and the early job enlargement studies can easily be seen, with the inclusion in the former of the dimensions of variety, autonomy, and task identity. The concept of variety however was used by Hackman et al., in connection with skills, not simply tasks, and that of autonomy was used to denote control over all aspects of a job, and not simply its pace (as was intended by Walker & Guest). The specification of employees with higher needs as the 'target population' was a response both to the work of Turner & Lawrence, and to that of Hulin & Blood.[16] These researchers claimed to have shown the existence of significant differences in job attitudes between urban and rural-origin workers, in urban and rural plants, with rural workers expressing 'higher needs' - for job variety, challenge etc., than their urban counterparts. And interestingly enough, the original, and now classic, assembly-line study by Walker & Guest involved many workers who had no previous industrial experience but had come from rural environments.

Criticisms and limitations of task design theory

The Hackman, Oldham and Lawler work has been used to inform a number of job changes, as we shall see below, and in reviewing the existing case studies an attempt will be made to evaluate its predictive value. For the moment, a number of shortcomings of their work should be mentioned. Firstly insofar as it hypothesises higher motivation and performance following appropriate job changes only for employees with

'higher need strength' it has a built-in conservative bias. The study by Cotgrove et al., for instance found that certain employees who had been very guarded in their response to the new jobs, were subsequently delighted on discovering that they could take more responsibility.[17] The process of implementation and the experience of redesigned jobs may in themselves help to foster appropriate psychological reactions. In any case, the job motivation-performance link may be mediated by factors other than 'need strength.' Agersnap et al.,[18] showed that two groups of workers on similar jobs had very different reactions to job redesign according to their degree of hostility towards, and suspicion of, management.

Hackman and Oldham have themselves accepted that their stress on high need strength employees was too much, and claim now that whilst such employees do show positive responses to 'job enrichment,' so too do 'lower need strength' employees, although the responses are weaker, and the correlations between job change and behaviour outcomes, lower.[19]

Secondly, it should be noted that even employees with high need satisfaction may not respond positively to job redesign because their needs are satisfied by other means. In a study at British Rail, the author encountered employees who were relatively content with jobs they perceived as adequate, not because they lacked 'higher needs' but because they satisfied these needs through other means, such as local politics, and trade union work.[20]

Thirdly, the Hackman et al. work is entirely lacking in

any dimension of time: jobs perceived as motivating at one point in time, may not be seen that way after a number of months or years because of employee expectations of career advancement, as Penzer has found.[21] And conversely jobs perceived to be relatively low on 'core dimensions' may be tolerated and performed well because they are seen as necessary steps on the path to more interesting work in the future, through career advancement. Cases of this type were also encountered in the B.R. study.[22]

Fourthly, the Hackman et al work is ambivalent, or perhaps we should say silent, on the question as to whether lower needs must be satisfied before higher needs can come into play.

And fifthly, we should notice the practical limitations of the Hackman et al model:

> ".....the job characteristics model is designed to apply only to jobs that are carried out more or less independently by individuals. It offers no explicit guidance for the effective design of work for interacting teams - ....." 23

Finally, it should be pointed out that there is some evidence (little as yet) suggesting that the relationships posited by Hackman et al. between the various components of their model may not hold up under all circumstances.[24]

There have, of course, been numerous criticisms of "job enlargement" as a whole, notably by writers of differing theoretical persuasions. Herzberg, for instance, spoke of job enlargement as a

> ".....Cooks tour" in which individuals have snippets of different activities, unrelated in any meaningful sense,....." 25

and later as being the addition of "... another meaningless task to the existing one."[26] Whilst Davis, writing from within the sociotechnical framework also equated "job enlargement" with the addition of "more of the same dehumanising tasks."[27] There is some validity in these criticisms, for as we saw, job enlargement was not until recently, placed on a proper theoretical footing, and clear recommendations for job redesign failed to emerge. This fact makes it quite probable that certain cases of 'job enlargement' did involve the simple addition of different tasks in a pragmatic manner. Nevertheless, we also saw that a number of redesign principles had begun to emerge in the early work - variety, task identity, some degree of autonomy - and from this point of view the charges of Davis and Herzberg seem exaggerated and unwarranted. Their criticisms in any case, rest on a contradiction, for as Herzberg argues the point about job redesign is not whether the task is interesting (or dehumanising etc.), not, what the employee (or Herzberg) <u>thinks</u> about the job, but whether it leads to higher motivation.[28]

Job 'enlargement' has also been criticised by Hulin & Blood on the grounds that supporting case studies contained deficiencies such as absence of control groups, absence of statistics, and confusion between cause and correlation.[29] Whilst some of these criticisms are justified, the authors actually argued for a job enlargement - individual differences model compatible with that of Hackman et al.

The question of individual differences

Neither sociotechnical systems theory, to be discussed in Chapter 4, nor Herzberg's theory, to be examined in the ensuing section, have said very much on the question of individual differences in response to job redesign. This area has been theorised and debated principally by writers working within a task dimensional framework, such as Hackman and Oldham. Clearly, this area can be seen as part of a broader discussion within industrial psychology on the nature of individual differences, but we shall concentrate here on the variables, such as growth need strength, and to a lesser degree, Protestant work ethic, that have been singled out by job redesign theorists.

The claim about the significance of such differences was eventually proposed in a sophisticated form by Hulin and Blood who suggested that some workers were not interested in job content, but in wages (these being described as alienated from middle class work norms), and were therefore unlikely to respond to job redesign.[30]

The earliest studies which examined these individual differences were conducted by Kilbridge,[31] MacKinney et al.,[32] and Kennedy & O'Neil.[33] Kilbridge found that a majority of workers on a paced assembly line preferred to be paced, rather than pace themselves, but whether this indicates a genuine preference, conservative bias, or a process of adaptation is extremely unclear. MacKinney et al. simply reviewed evidence on this question and concluded that since there was data to suggest arguments for and against specialisation, that no

general conclusions could be drawn. Kennedy & O'Neil examined job attitudes as a function of job content using car assembly workers and utility men, and found differences in some groups, but not in others. Overall they argued job content was only one of a number of determinants of job attitudes.

But we are justified in asking how such studies relate to change situations - what do they tell us, if anything, about the way workers might respond to job enlargement? The study by Conant and Kilbridge attempted to answer this question.[34] A group of 61 workers had their job of water-pump assembly reorganised from a six-man progressive assembly line (with mechanised pacing) onto individual assembly. 46 operatives said that, overall, they liked the individual, bench assembly, 11 were neutral, and only 4 disliked it. At the same time, however, 30 workers <u>also</u> said that liked the mechanised line (16 were neutral, and 15 disliked it). In other words, <u>at least</u> 15 workers (25%) said they liked both methods of working, and fortunately the study provided some of the reasons for this absence of a straightforward preference. Most liked features of individual working were: self-pacing (48), quality control (53), and individual incentive (53), with the absence of social interaction (28) and the inadequate learning time (23) being the most disliked features. As one would expect, the line was liked because of the easier learning and greater opportunities for social interaction, but opinion was divided on questions such as specialisation, lack of sub-assembly completion, and mechanised pacing. Indeed, at least 11, and possibly as many as 24 workers liked <u>both</u> the self pacing on the bench <u>and</u> the

mechanised pacing of the line. Benchwork was also complained about because of the hard work and 'tight' rates. We also find complex attitudes on the question of variety: 47 workers enjoyed the variety of work on the bench, but 32 expressed a liking for specialisation on the line, so that at least 18 (and perhaps as many as 32) liked both.

In conclusion, it appears then that some workers adopted different frameworks and values for different types of job: specialisation may have been acceptable because it was easy, there was rhythm to the work, and it required relatively little effort. On the other hand, an enlarged job may have been judged against different criteria; such as variety, autonomy, responsibility etc. What this means is that we cannot infer the absence of the latter framework from the presence of the former, for significant sections of workers, a conclusion supported by evidence from a number of change situations.

On the broader question of individual differences, 15 workers (out of a total of 61) i.e. 25% were hostile or indifferent to the job changes with 75% being in favour. These figures do not accord with the more widespread view, held in Britain, that perhaps only 20% of the workforce is interested in job content, and would be likely to show a favourable response to 'job enrichment.'[35] This conclusion (which has also been drawn in America) is based on attitude surveys of job satisfaction, and the finding that between 10 and 20% of a local or national workforce is 'dissatisfied,'

is by now well established.[36] But we can legitimately question the inference that because the remaining 80 - 90% express job satisfaction on an attitude survey, they are therefore uninterested in job content. The study by Conant and Kilbridge showed clearly that some workers use different criteria to evaluate different jobs, whilst work by den Hertog,[37] and by Cotgrove,[38] has shown that in the course of job changes workers may also change their evaluative criteria. Structural changes in job content, work organisation etc. may, in themselves help generate attitude change, and we cannot therefore argue from the existence of negative attitudes against such change. To do so is to take a static view of attitudes, which fails to appreciate their dynamic interaction with the environment, both physical and social.

The work of Hackman and Oldham is generally thought to have placed the discussion of individual differences onto a new level of sophistication, by means of a battery of measures of job perceptions, attitudes, and need strength.[39] Interestingly enough this work has demonstrated only the relative insignificance of individual differences in need strength. The study of thirteen different jobs in a telephone company revealed that the mean score on a twelve item, seven-point scale (0-7) of need strength was 6·01, well above the mid point, and very close to the upper limit.[40] Despite this fact certain differences in attitude and behaviour, as a function of task dimensions, did emerge in the study. Level of intrinsic motivation, quality of performance, job involvement, and a variety of specific items of satisfactions all correlated more highly with

motivating job content for higher need employees, as compared to those less affected by such needs. Nevertheless, two points should be noted: firstly, the correlations were not significantly different for the two groups of employees on all items, and general job satisfaction, taking personal responsibility, quantity and effectiveness of work, and absenteeism are all examples of this. Secondly, 21 of the 22 correlations were in the same direction, so the relationship between job content, and attitudes and behaviours was positive for most items, and for most employees. Individual differences in need strength did not affect the direction of the relationships, but only their strength, and then only in eight cases out of 22. The evidence then hardly warrants the conclusions that individual differences, of the sort looked at, were of major significance, and this point seems to have been accepted by Hackman and Oldham in a later paper.[41]

What they concluded therefore was, not that job redesign might be appropriate for some, though not all employees, but rather that whilst appropriate for the majority, some employees would respond less enthusiastically than others. This conclusion of course must be given some qualification, as Hackman et al. only examined some individual differences: they did not, for instance, examine measures of personality.[42] All that can be said then is that differences between individuals on a variable-higher-need strength - thought to be salient turned out to affect only the intensity but not the direction, of the hypothesised job perceptions - job behaviour relationship.

Summary and conclusions

The early job enlargement writers focussed their attention on the dimensions of jobs thought to be related to improved performance and satisfaction, dimensions such as variety, and control of work pace. Later writers in the task dimensions tradition, such as Hackman et al. have both elaborated the number of dimensions salient to these outcomes, and have conceptualised the nature of individual differences in response to job redesign along the dimension of 'growth need strength.'

This review of the task dimensions approach sought, first of all to defend the approach against a number of unwarranted criticisms by Herzberg, Davis and others. At the same time it endeavoured to point out some of the problems with the approach, such as its inadequate conception of individual differences; its notion of population sub-groups, rather than different frames of reference adopted by individuals in different situations; its lack of attention to time perspectives, and to the notion of careers; its lack of attention to social dimensions of work; and the relationship between the notions of individual differences and the data from which they supposedly derive.[43]

At a more general level however, the work of this school has clarified considerably those job characteristics which ought to be manipulated in a job redesign exercise, and it thus has a substantial heuristic value. And despite the problems and limitations to be found in the discussions

of individual differences, writers in this 'school' have at least tried to advance beyond the alleged universalism of Herzberg, and sociotechnical systems' theorists.

HERZBERG'S JOB ENRICHMENT

Development of the theory

Herzberg's two-factor theory of job attitudes had its origins in a review of job satisfaction studies published in 1957.[44] The literature appeared to offer contradictory findings on every question, but Herzberg and his co-workers suggested a possible resolution. They argued that the results obtained in the studies varied according to whether the subjects were being asked about their job likes, or about their dislikes, and conducted their own research to test this hypothesis. The original pilot study spanned a considerable range of occupations, but on finding professional workers to be more fluent and articulate, the final study used a sample of 203 engineers and accountants from the Pittsburgh area.[45] The basic interview question asked them to "think of a time when you felt exceptionally good or exceptionally bad about your job,....." and the nature and meaning of the events mentioned were explored in a series of further questions. The replies were then subjected to content analysis and out of this procedure emerged the most original innovation in Herzberg's theory. He suggested that, whereas previously any job factor, such as recognition, pay, conditions etc., had been assumed to act on a continuum, from high satisfaction through to high dissatisfaction, his own findings suggested these factors were bipolar. One

set of factors, called hygiene factors, e.g. pay, supervision, work conditions, created dissatisfaction when absent, but when present only removed this dissatisfaction. The generation of satisfaction itself was the product of another, different set of factors, called motivators: when present they created satisfaction but when absent, employees lacked feelings of satisfaction but did not experience feelings of dissatisfaction.

In full, Herzberg et al. isolated sixteen first level factors - situations or events - and twelve second level factors - meanings attached to events, but the motivator - hygiene dichotomy has usually been taken to cover ten first level factors. The motivators were given as: achievement, recognition, work itself, responsibility and advancement, whilst the hygiene situations/events were: company policy and administration, salary, supervision - technical, supervision - social aspects and working conditions. The labels 'motivator' and 'hygiene' were assigned because the former set of factors seemed to revolve around an employee's work and its performance - job content - whereas the latter appeared to be located in the environment, or the context of work. These two sets of factors were associated not only with good and bad feelings respectively, but also, according to Herzberg, with work performance, and absenteeism. Good feelings were linked to 'good' job performance.

Herzberg then proceeded to draw the conclusions on which his strategy of job enrichment is based. Since the

majority of hygiene factors were well catered for in most industrial establishments,[46] and since, as Herzberg had shown, these could not, in themselves generate job satisfaction, good performance etc., it followed that the route to increased productivity and efficiency lay through the 'motivators.' Only by attending to the content of work, rather than its context, could these goals be achieved.

Further developments: from Motivation to Work, to Work and the Nature of Man.

A number of assumptions of two factor theory, implicit in Motivation to Work, were rendered far more explicit in Work and the Nature of Man,[47] ostensibly an attempt to generalise the earlier findings into a more far-reaching theoretical form. The most striking feature of this book was its overt adoption of a need-hierarchy theory as the underpinning, and explanation, of two-factor theory. According to this view man has a dual character; on the one side (his 'Adam' nature) a desire to avoid pain (broadly defined); on the other , a need to achieve psychological growth. This dual character corresponds to the distinction between hygiene and motivator factors respectively. and may be seen as an attempt to transform a contingent, socio-psychological theory into a purely psychological view deriving necessarily from "human nature." At this level of abstraction the theory is unobjectionable, if platitudinous, although when cast into the mould of a 'need,' or 'human nature' theory it is of course subject to the strictures and shortcomings applicable to any theory of that kind, such as

Maslow's need-hierarchy.[48] In other words, the origins of the 'needs' are difficult to specify, it is difficult to see how one could test such a theory, given its vagueness, and high level of abstraction, and it would seem, on the face of it, difficult to cope with individual differences in expressed preferences.[49]

Herzberg's answer to these questions takes us to a consideration of a second major feature of this work, namely the resort to psychologistic explanations. In 'Motivation to Work' we were offered a structural account of occupational differences in job attitudes - manual workers had less experience of motivators as compared with professional workers - although we were assured the motivator-hygiene dichotomy would nevertheless be found among such workers. By 1966 this view had changed substantially.

> "A hygiene seeker is not merely a victim of circumstances, but is motivated in the direction of temporary satisfaction. It is not that his job offers little opportunity for self-actualisation; rather, it is that his needs lie predominantly in another direction, that of satisfying avoidance needs..... his resultant chronic dissatisfaction is an illness of motivation." 50

The contrast between the two explanations is striking - the former stressed structural and environmental features - whilst the latter, although not explicitly abandoning these views, inserted a strongly argued psychological intermediary. That the transition between the two works was not a simple sociological-psychological shift, was indicated by the explanations given for a number of hygiene-motivation reversals

a ong women. These were related to feelings of insecurity derived from working in a male-dominated society.[51] Nevertheless, there was much greater stress on the psychological link between behaviour and the environment in the later work, and there was also a recognition of individual differences in motivation, even if the explanation, couched as it was in terms of pathology, left something to be desired.[52]

Associated with the shift to psychologism was an increased stress on individualism, at the ontological plane. In theory, one could have argued, as Batsone has done, that the attitudes elicited by Herzberg in his original study were an outcome, at least in part, of social relations.[53] Herzberg, however, relegated social relations to the category of a hygiene factor - capable only of alleviating dissatisfaction.[54] Although arguably a reaction against "human relations theory," this view also rested on a more profound substrate. Social relations were seen by Herzberg as a "factor" existing independently of individuals, in the same way that salaries, jobs, and working conditions were independent of them. They existed "out there," in the environment, and were in no way a part of individuals themselves. The complement to this view of social relations was that of the isolated individual:

> "The primal fact is that each human being is separate, distinct, and a unique individual..... There is no organic connection between individuals after the umbilical cord is cut; all connections become the inventions and delusions of man." 55

And not only was individualism a biological fact, it was a psychological and social value.[56]

Herzberg's lack of attention to trades unions is thus partly due to this profound individualism, and indeed, insofar as they assert collective, as against individual rights, trades unions must figure as villains in the Weltanschauung of Herzberg and his associates.[57] In a recent publication the logic of this position has been drawn out in relation to socio-technical systems theory, which was criticised on the grounds that it sought to impose "the tyranny of the group over the individual."[58] And Herzberg also observed, quite correctly, that socio-technical theory also laid very great stress on the integration of individuals into a group, possibly even to the exclusion of changes in job content (see Chap. 4).

Finally, we should notice the assumption, common to all theories of job redesign, and to Taylorism, that the interests of workers and their employers can be harmonised. The basis on which Herzberg proposed to achieve this, was also common to all these theories. Changes in job content will lead to higher productivity, and lower turnover and absenteeism for employers, and,

> "To the individual, an understanding of the forces that lead to improved morale would bring greater happiness and greater self-realisation." 59

The employer gains economically, the employee gains psychologically.

Criticisms and limitations of the theory.

It is now eighteen years since these conclusions were first published, and they have given rise to an immense

amount of research and a considerable degree of controversy. Three major criticisms have been made, each of which has differing implications, both for the theory, and its accompanying strategy. Firstly, it has been claimed by several researchers that Herzberg's conclusions are artefactual, that is they result from features of the method of content analysis which he employed. Studies using different methods have tended not to reproduce the motivation-hygiene dichotomy.[60] Secondly, it has been pointed out by King, and by Wall & Stephenson,[61] that there are in fact five possible interpretations of the two factor theory, for two of which there is no empirical support. A third possibility is supposedly artefactual, whilst the remainder have yet to be adequately tested. These conclusions have also been reproduced, and accepted, by Miner & Dachler in their contribution to the Annual Review of Psychology, 1973. Indeed they went as far as to suggest the two-factor theory should be either modified or else" .....laid to rest."[62] Thirdly, Vroom suggested that whilst the bipolarity discovered by Herzberg was a genuine, rather than an artefactual, phenomenon, its basis did not lie in the distinction between job content and job context. Rather it reflected the fact that people tended to lay the blame for dissatisfaction at the feet of others - company or supervisors - whilst claiming their own activities as the source of satisfying experiences.[63] Wall & Stephenson investigated this idea and

claimed that these were differences between people in the direction predicted by Vroom.[64]

The second criticism leaves open the validity of Herzberg's theory, since evidence might in fact support the untested versions of the theory. The first and third arguments would tend to suggest that the content/context distinction is invalid and hence, by implication, that an enrichment strategy focussed chiefly on job content may not be the most effective, as Herzberg would suggest. It would follow from these views that either job content or context could be associated with job satisfaction and motivation, and hence with performance, and we shall consider these possibilities when looking at the case studies based on Herzberg's theory.

There are three further points which also merit examination since they have implications for the strategy of job enrichment. The first centres on the role of salary, which according to Herzberg functioned as a more potent cause of dissatisfaction in conjunction with other hygiene factors, than the motivators combined, but nevertheless it occurred as often in the genesis of good feelings, as of bad. On one interpretation of Herzberg, it would seem therefore to pose problems. Herzberg's own solution is far from convincing, consisting of the view that since salary was mentioned three times as often for long, as opposed to short-time span situations/events associated with 'bad' feelings, one can therefore say it is a more potent (in the long run) source of dissatisfaction.[65] The data, however, would also fit the

view that over the short or long term salary can be a source of both satisfaction and dissatisfaction. This problem of salary was encountered once more when Herzberg attempted to explain the apparent efficacy of wage incentives in raising productivity. On this question he developed two arguments in a very ad hoc manner. First of all he contended that salary schemes such as the Scanlon plan, or the participation and pay scheme of the Lincoln Electric Company derived their benefit from the motivators of responsibility and recognition associated with participation in company affairs. In other words, the pay increases were not in themselves responsible for attitudinal or behavioural changes.[66]

This interpretation is in fact quite incompatible with Herzberg's own theory, according to which company policy and administration is a major hygiene factor, incapable of acting other than to mitigate dissatisfaction. One can only assume that the desire to downgrade the significance of pay has marred Herzberg's judgement.[67] His second argument on the question of pay was premissed on the pervasiveness of output restriction so that what pay increases, or incentives did was to return output back to the "norm" (defined presumably by the employers). Nevertheless, he went on to assure us that,

> "The improvement produced under these circumstances is actually far less than one could obtain were motivators to be introduced." 68

Contrary then to some of the more popular misconceptions about Herzberg's attitude to pay, namely that he ignores it, or treats it as a factor which must be satisfied prior to motivational change, he does in fact accept that where there is restriction of output, pay can serve to raise it. And since he admits that such restriction is practised on "an enormous scale," it would follow that pay increases can be effective on a similar scale.

The second point concerns the occupational bias of Herzberg's findings. It is well known of course, that his original conclusions derived from engineers and accountants, two groups of professional workers who presumably held attitudes towards their work that are rather different from, let us say, factory operatives. A number of indications that this was so are to be found in Herzberg's book. For instance, at one point he noted that,

> "Workers complained of too little work more than of too much." 69

The final point is the conceptual, and empirical, conflation of motivation and satisfaction. It will be recalled that Herzberg attempted to assess the correlates of good and bad <u>feelings</u> at work, yet he was quite clear that,

> "To industry, the payoff for a study of job attitudes would be in increased productivity, decreased turnover, decreased absenteeism, and smoother working relations." 70

How, we may ask, did he arrive at a prediction of these <u>behavioural</u> outcomes from a study of <u>attitudes</u>? What he did <u>not</u> do was to study company records in order to obtain data on the sort of variables just mentioned. He relied

instead on respondents' retrospective reports. 73% of the reports of events connected with good feelings also contained reference to performance effects, such as increased effort, whilst 48% of bad feeling events resulted in effects, such as reduced performance. Apart from the obvious problems of memory failings, and the halo effect, we are not told precisely what the effects actually comprised. The implication of this section in Herzberg's book is that all the effects were in the anticipated direction, that is good and bad feelings were linked with high and low performance respectively, but in the absence of data this view can only remain at the level of implication. The strategy of job enrichment was predicated on the idea that there <u>was</u> such a link between job content, satisfaction, and motivation, although as we shall see in our case studies the question, in practice, is rather more complex. With regard to turnover, a similar pattern of results was obtained (but more details were given). In general however, the logical problem with these data is that since so few instances of dissatisfaction with motivators, and satisfaction with hygienes were actually reported, their effects on performance and turnover could not reasonably have been assessed. One would thus require far more data of this sort before being able to state so firmly that there is a positive correlation between motivators and high performance, and between hygienes and poor performance.

It cannot be assumed, in other words, that job <u>satisfaction</u>, as measured by Herzberg's respondents, will

necessarily correlate with motivation, nor indeed, that motivation will correlate with performance (since there may be technical obstacles for instance, to performance).

Summary and Conclusions

The two-factor theory of job attitudes was described, and further developments in Herzberg's thought were outlined and criticised. In particular it was observed that his conceptualisation of "the hygiene seeker" took on a much more psychological character in his later work. Three common criticisms of the theory were discussed: artefacts, ambiguity, and the psychological basis of the content/context distinction. Each was assessed and the implications for job redesign were considered. Next the adequacy of the theory was assessed in the light of Herzberg's own data, and the possibility of misinterpretation of the effects of pay was noted. The occupational bias in Herzberg's data was discussed, and it was also pointed out that Herzberg had tended to conflate the concepts of motivation and satisfaction.

NOTES AND REFERENCES

1. cf. Guest, R.H. 1957; Paul, W.J., Robertson, K.B. & Herzberg, F. 1972; Hulin, C. & Blood, M.R. 1968 (on job extension); Wild, R. 1974; Davis & Taylor, 1972, (job design); Schumacher, C. 1976/77; Philips, N.V. 1969; Birchall, D. & Wild, R. 1973, talk of vertical and horizontal job enrichment, whilst Lawler, E.E. 1970, talks of horizontal and vertical job enlargement. The term 'work improvement' has also been used: see Bryan, E.J. 1975. And for job and work "reform" see Lindholm, R. et al., 1975. For horizontal and vertical job restructuring, see Cummins, T. & Salipante, P.F. 1976; See also Carby, K. 1976; Woodman, R.W. & Sherwood, J.J. 1977.

2. Herzberg, F. 1968.

3. cf. for instance Gowler, D. & Legge, K. 1972.

4. Turner, A.N. & Lawrence, P.R. 1965.

5. cf. Chung, K.H. & Ross, M.F. 1977, for a related viewpoint. See Hackman, J.R. & Lawler, E.E., op. cit.; Guest, R.H. op. cit.; and Cooper R. 1973.

6. Walker, C.R. 1950.

7. cf. also Drucker, P. 1968, pp. 310-13.

8. Walker, C.R. & Guest, R.H. 1952.

9. 'Conclusions,' ibid.

10. Guest, R.H. 1957.

11. ibid., pp. 12-13.

12. ibid, pp. 10, 13-14.

13. Hackman, J.R. & Lawler, E.E. 1971, Hackman & Oldham, 1971, Hackman, J.R. & Oldham, G.R. 1975; Hackman, J.R. 1975A,B. Hackman, J.R. & Oldham, G. 1974B; Hackman, J.R. et al. 1975.

14. Turner, A.N. & Lawrence, P.R. 1965.

15. Hackman & Oldham, 1974, pp. 3-6.

16. Hulin & Blood, op. cit. See also Hulin, C. 1971.

17. Cotgrove, S. et al. 1971, Chap. 5.

18. Agersnap, F. et al. 1974.

19. Hackman, J.R. & Oldham, G.R. 1974, p. 26 ff. Oldham, G.R. et al. 1976, have presented evidence in support of this view. Giles, W. 1977, on the other hand showed that growth need strength did appear to differentiate the act of volunteering for enrichment, although he didn't examine subsequent performance and attitude differences.

20. Kelly, 1976.

21. Penzer, W.A. 1973; See also Kelly, J.E. 1978B.

22. See previous notes.

23. Hackman & Oldham, 1974B, p. 29. However Hackman, J.R. 1977, has, in fact, tried to theorise at the group level. For criticism of the attempt, see Wall, T.D. & Clegg, C.W. 1978.

24. Wall, T.D. et al. 1978.

25. Herzberg, F. et al, 1959, p. 133

26. Herzberg, 1968, p. 118.

27. Davis, in Davis & Taylor, 1972, p. 160. It is perhaps worth pointing out that Thorsrud writing, ostensibly, from within the same perspective held 'job enlargement' in much higher regard than Davis, at least under certain conditions. Thorsrud, E. 1967.

28. Herzberg, F. et al. 1959, pp. 133-134.

29. Hulin & Blood, 1968.

30. Hulin & Blood, 1968, See also Blood, M.R. & Hulin, C.L. 1967.

31. Kilbridge, M. 1960A.

32. MacKinney, A.C. et al. 1962.

33. Kennedy, J.E. & O'Neill, H.E. 1958.

34. Conant, E.H. & Kilbridge, M.D. 1965; see also Kilbridge, M.D. 1960B.

35. Mandle, I. & Lawless, J. 1971; Wild, R, 1975, Chap. 11; but see Wild, R. & Birchall, D. for a different estimate.

36. cf. for example, Wool, H. 1973.

37. den Hertog, F. 1974, p. 24.

38. Cotgrove, et al., 1971.

39. Hackman & Lawler (1971); Hackman & Oldham (1974a, b) op. cit.; Hackman & Oldham (1975) op. cit.

40. Hackman & Lawler, 1971, p. 281, ff.

41. Hackman & Oldham, 1974, p. 27.

42. Nor did they examine, for instance, urban and rural differences, or the 'Protestant work ethic' as moderators of job content - performance relationships. For critical evidence on these items see Susman, G. 1973, and also Stone, E. 1975; 1976.

43. I have not examined here the particular task dimensions isolated by these theorists, such as variety, autonomy, etc., nor considered some of the difficult questions of measurement which they entail. Suffice to say that the RTA, relied upon to some extent by Hackman et al. does not always appear to measure what it claims, particularly with such concepts as 'task identity' and 'task significance.' See on this general area, Rackham, J. & Woodward, J. 1970, and on a particular dimension, variety, see Hill, A.B. 1970.

44. Herzberg, F. et al. 1957.

45. Herzberg, F. et al. 1959, p. 32.

46. ibid, p. 124

47. Herzberg, F. 1966.

48. Maslow, A.H. 1943.

49. cf. Peters, R.S. 1968, Chap. 5 for a discussion of some of the problems inherent in this 'new hedonism,' and pp. 122-29 on 'need' as a concept.

50. Herzberg, (1966), p. 81.

51. ibid, p. 128

52. ibid, p. 80

53. Batstone, E. 1975.

54. Although he did suggest that workers whose jobs involved social interaction as an integral aspect, may report this as a 'motivating factor.' cf. Herzberg et al. (1959) p. 103.

55. Herzberg, (1966), p. 66.

56. ibid., p. 67

57. The Lincoln Electric Company was able to institute a payment and promotion system based on merit, and not seniority, because of the absence of a trade union - see Herzberg et al. (1959) p. 117, also p. 109.

58. Herzberg, F. 1974; Herzberg, F. In Herzberg, F. 1976.

59. Herzberg, et. al. (1959) p. ix.

60. King, N. 1970.

61. Wall, T.D. & Stephenson, G. 1970.

62. Miner, J.B. & Dachler, H.P. 1973.

63. Vroom, V.H. 1964, p. 129.

64. Wall & Stephenson, op. cit., Although Bobbitt, H. & Behling, O. 1972, claimed to have found no support for this view or for Herzberg's. Their study however, looked only at attitudes to supervisors, not to all aspects of the work situation. And there is some controversy over their interpretation of 'defence mechanisms.' cf. Locke, E.A. ibid., pp. 297-98 and Bobbitt, H. & Behling, O. ibid., pp. 299-300. There is also the possibility that employee assignations of sources of satisfaction and dissatisfaction were actually incorrect. For example, changes in job content, advancement, recognition etc., may often be the outcomes of supervisory practices, and company policy and administration, i.e. satisfactions may be mediated by, or reside in job content factors, but originate in context factors.

65. Herzberg, et al. 1959, pp. 82-3.

66. ibid., pp.117-18. This idea that pay increases have a symbolic rather than a material value has been used by a number of job redesign theorists to downgrade the significance of pay, andto go straight to the "real" problem, such as recognition etc. cf. Trist, E.L. & Bamforth, K. 1951.
This tendency has in fact diminished in recent years, and a number of job redesign proponents have come to recognise the over arching significance of pay: cf. Walton, R.E. 1974; Hill, P. 1971, p. 144

67. Just as ostensibly extrinsic rewards may be interpreted for their intrinsic content, so equally may 'intrinsic' rewards, e.g. advancement, be valued for their extrinsic content.

68. Herzberg, et al., 1959, p. 118.

69. ibid., p. 74.

70. ibid, p. 85 ff.

CHAPTER 4 THEORIES OF JOB REDESIGN II : SOCIOTECHNICAL SYSTEMS THEORY

Introduction

Sociotechnical systems theory possesses a number of features which set it apart from the theories of job redesign reviewed in the previous chapter. To begin with there are, as noted previously, only two major, published reviews of the theory, each written from a rather different perspective, and each, in certain respects, inadequate.[1] This contrasts with the situation regarding task dimensions and job enrichment theory, where there have been many criticisms and appraisals by a large number of writers. There is, in other words, a much more attenuated body of work on sociotechnical systems theory from which to develop, and on which to build, further criticisms.

Secondly, there is a much more direct relationship between the concepts of sociotechnical theory and the series of practical innovations associated with it, as compared with the theory of job enrichment (developed out of a survey of job attitudes) and the later task dimension theory (which was refined using concepts derived from a cross-sectional study of jobs by Turner and Lawrence).

Thirdly, the few case studies conducted by prominent sociotechnical theorists are either of book-length, or are certainly longer than the article typical of academic or business journals. This means there is a far greater wealth

of material on which to draw in the construction of critiques of sociotechnical theory. Because there has been so little critical material published about the theory, because of the close relation between the theory and practice, and because this practice has been extremely well documented, it has been decided to go further in the discussion of socio-technical theory as compared with job enrichment and task dimension theories, and to begin the development of a number of alternative concepts more appropriate for understanding sociotechnical practice. This procedure will, to some degree, anticipate a number of the themes to be more fully elaborated in Chapter 5, and conversely, the discussion later on will build on the conclusions drawn in the examination of sociotechnical theory and practice. Whilst arguably interrupting the flow of the text, this procedure does have the advantage of providing some empirical basis for the later discussion which would otherwise have little basis, and which would, therefore, be inserted into the text, 'out of the blue.'

What will be attempted in the present chapter therefore, in addition to an examination of the development of the theory, is a detailed and systematic appraisal of the major concepts of sociotechnical systems theory in the light of the job redesign cases from which they are supposedly derived (at least in part), and which they are supposed to underpin.

The major concepts of sociotechnical theory

Sociotechnical theory was originated by Trist and Bamforth (1951)[2] shortly after the Second World War in a paper on the effects of mechanisation in British coal mines. The authors argued that a production system could not be seen either as a technical system - plant and machinery - or as a social system - social relations and work organisation - but had to be seen in terms of both of these concepts. A production system in other words, was a sociotechnical system. The argument was based on the fact that mechanisation in the coal mines had disrupted the previous organisation of work - the hand got system - in which a small team of two or three miners performed all of the tasks necessary for the extraction of coal. This disruption of what was considered to be a psychologically 'effective' mode of organisation was said to emanate from the perception of the production system as purely technical in character, when in fact it ought to have been seen as socio-technical.

From this analysis followed the proposition that effective performance, defined usually in terms of output, absenteeism, morale etc., was a function of matching, or jointly optimising the social and the technical systems. If one system, e.g. the technical, were maximised at the expense of the other then the result would be, not maximum performance, but sub-optimum performance, as in the British mines.

The analysis of the coal mines also suggested that the technical system, or the technology, need not determine, in simple fashion, the organisation of work. Indeed, organisational choice was said to be possible and for a given technology several social systems were possible.[3]

The form of work organisation employed in the coal mining, and in subsequent studies, was that of the autonomous work group. This was a group of multi-skilled workers which possessed all of the skills essential for the performance of a particular, 'whole' task, and which decided on its own allocation of labour, and sometimes on other matters, such as internal leadership.

In view of the obvious prominence of the notions of social and technical systems it is perhaps surprising to discover that only one attempt has been made to produce a detailed characterisation of these terms.[4] Most accounts adopt a rather crude working definition of the social system as comprising work or occupational roles, and worker inter-relations, and the technological system as the machinery and its spatio-temporal layout.[5] There has been a suggestion, and some disagreement, as to whether a third dimension -the economic system - should also be included, on the grounds that a production system must also satisfy financial, as well as social and technical, requirements if it is to be effective in attaining its goals. Both Emery[6] and Trist et al.[7] argued against this view, claiming that the economic dimension could best be understood as a measure of the effectiveness of the other two.

These two systems, the social, and the technical, were thought to interact, creating 'forces' which then had psychological effects on individual workers. The socio-technical system could be designed so that these 'forces' induced task performance, or, on the other hand, induced avoidance.

These various principles can be briefly illustrated in the two early, and classic, case studies. In the Durham Coal Mines the introduction of new technology was associated with the break-up of small, skilled workgroups and the introduction of a series of specialised work roles.[8] The problems of co-ordination between the different roles, and shifts was attributed to a socio-technical mismatch. The researchers therefore helped create 'autonomous' (or composite) groups which combined all the skills required for coal extraction and which regulated many of their own activities.[9]

In the Indian weaving shed study Rice also diagnosed a social/technical mismatch for whilst the technology demanded worker <u>inter</u>dependence (so as to ensure maximum machine utilisation), the workers themselves were organised into <u>in</u>dependent work roles.[10] Rice's solution was therefore to create work groups based on interdependent roles: although each worker might then ordinarily perform one task, he was to be responsible for all of the activities of the group.

Since the completion of those studies two main theoretical developments have occurred: firstly, Emery attempted to specify the precise determinants of psychological reactions

in employment, by examining task structures (in a rather rudimentary way), and by drawing on the concept of alienation to which autonomous work groups were seen as a potential corrective;[11] and secondly, Emery, Thorsrud & Trist developed a list of job redesign principles, and of employees' psychological needs, in the context of the Norwegian studies on job redesign.[12]

Responsible Autonomy and Autonomous Work Groups

In the Durham mining study Trist et al. characterised the hand got system as one based on 'responsible autonomy.'[13] The workers controlled their own task pace and their internal division of labour, performed a 'whole' task, exercised a multiplicity of skills and selected themselves into work teams. The mechanisation of cutting and hewing temporarily eliminated much of this autonomy: tasks were divided and individuals specialised, although movement between work teams and faces was still under the control of the men through their union lodge. The self selection, known as cavilling, not only allowed men to move between teams, but more importantly it randomised the distribution of coal faces between work teams so that good and bad faces would be more evenly shared out, and hence earnings equitably distributed over the long term.[14] Not surprisingly, as Trist et al. reported, the better workers tended to cluster together in order to maximise their earnings. The cavilling system would not necessarily result in the highest possible output of coal, and nor was it intended to.[15]

The creation of autonomous, or composite, work groups was based on the assignment of responsibility for a complete cycle of mining activity to the group. What did autonomy mean in practice? It meant that all members of the group were responsible for all of its tasks, a responsibility that was reinforced by the provision of a common paynote,

and by training in the requisite skills. These developments went some way to reversing the specialisation and isolation of labour that accompanied mechanisation and the creation of separate pay systems, but there was a drawback. According to the researchers the system of cavilling was 'out of place', and 'dysfunctional' under mechanisation, resulting in 'sub-optimum deployment of experience.'[16] For with the advent of mechanisation on a large scale, it becomes extremely costly to allow the machinery to stand idle, or to be under-utilised. The system of cavilling created work teams unequal in ability - some would extract close to the maximum value out of the machines, but others would obtain much less. Given the costs of idle machine time, it became imperative to replace cavilling by 'planning.' Within the plans devised by management and unions, the men would then have their say.

Let us turn to another example, the case of the wire-drawing mill of Christiania Spigerverk. The production system here consisted of a dozen or so benches, 10-12 m. in length, each manned by one worker. Their task was to weld together bundles of wire, connect them onto one end of the bench, and set the motor running so that the wire was drawn along the bench, and stretched. The researchers proposed that the workers should collectively take responsibility for all of the benches - this would enable the men to allocate labour as and when required (much of their time was spent in inactivity) and would also facilitate increased social interaction. The stress of coping with wire breakages

might also be reduced, since it would be shared among the whole group. Once again however, there was a drawback: the researchers insisted there had to be less men than the number of benches,

> "Otherwise it is difficult to see how they would make effective use of the time saved and it was considered that it would be difficult to break the old system of one man, one machine." 17

During the first phase of the experiment reduced manning was rejected, only to then be accepted during the second phase.

Finally, Rice's work in India involved the destruction of the indigenous factory culture in which it was customary, because of the climate, for workers to deputise for co-workers whilst they went outside to cool off or relax.[18] These three studies indicate the necessity (in sociotechnical terms) for the prefixing of 'responsible' before the word autonomy, for where autonomy clashed with the employer's economic demands (as in Durham and India), or was giving them no advantage (as in Norway) it was curtailed. In all cases economic imperatives were uppermost, and demanded an end to cavilling, a reduction in manning, and an end to traditional work organisation. These tendencies do not in fact conflict with sociotechnical theory: for although it is the stated intention to jointly optimise social and technical systems, it is also assumed either that men have a need to get their job done (Rice) or that tasks can be structured so as to induce performance (Trist, Emery).

And at a more general level we should also recall the broader object of sociotechnical theorists - to maximise machine utilisation (Trist), or as Rice put it, as usual more brusquely, to 'keep the machines running.'[19]

The broader objective may be seen by considering briefly the actual practice of the sociotechnical researchers. In the cases which they reported their work consisted of the radical transformation of social (rather than sociotechnical) systems which were incompatible with the demands of production. For Rice the problem was twofold: on the one hand the indigenous factory culture, with its norms of slow working, long meal breaks etc. was inadequate;[20] on the other hand, the village culture, with its norms of sociability could be used to underpin the destruction of the factory culture. In Trist's case the existing social system in the mine was personally, as well as economically unsatisfactory, and the old work tradition was very recent: there was therefore much less destruction required than in the case of Rice. And in the cases of the Norsk Hydro and Christiania plants in Norway, the projects consisted of replacing individualised work roles with multiple-task roles. Nevertheless, the general conclusions were very similar: with the growth of capital-intensive, rather than labour-intensive industry, it became imperative to 'keep the machines running.'[21]

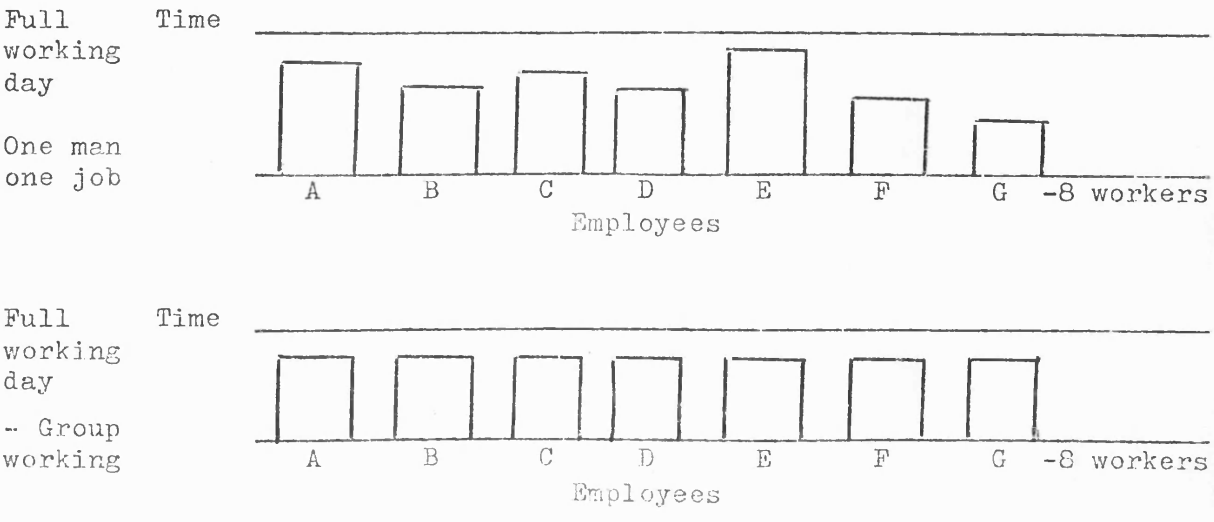
I would like to suggest however a different interpretation of the sociotechnical emphasis on autonomous work groups and 'responsible autonomy.' Let us first of all recall the

industries in which their research has been concentrated: coal mining, textiles, fertilisers, papermaking, wiredrawing, light assembly, and public transport. With the exception of assembly work, these processes have one feature in common, that of high process uncertainty. Continual and unpredictable variation occurs either in the raw material itself (mining, textiles, wire-drawing, public transport) or in the production process (chemicals, fertilisers, paper-making). Of course in a statistical sense this variation may be relatively predictable, but what cannot be predicted with any degree of accuracy are the short term and momentary changes in the production process which require swift intervention by operatives for their correction. Such short run unpredictability is more characteristic of chemical process production - as in fertilisers, paper-making - or of production with inherently unpredictable raw materials - coal, textiles, or wiredrawing - or of production with fluctuating workloads - public transport, than it is of assembly work, or indeed of much engineering, manufacturing, or clerical work. And it is in the former type of case that sociotechnical work on job redesign has been concentrated.[22] Of course, other sociotechnical work, on organisational power for instance, may not be amenable to this type of analysis: we are concerned for the present however with the major work of sociotechnical theory in the field of job redesign.

The creation of autonomous work groups is intended to allow such "variances," as they are called, to be controlled

as near to their point of occurence as possible, this being deemed both efficient, for the company, and satisfying for its employees. I would suggest that the existence of variance (or 'uncertainty') in these cases renders the precise allocation of workloads on an individual basis very difficult. Some workers may be compelled to work extremely hard, whilst others are 'relaxing:' precise specification of duties, in the style of F.W. Taylor may thus be unworkable (see Chap. 2). The solution, discovered by the sociotechnical researchers is to effect a transition from the individual to the group as the crucial unit of analysis and action, for variances in production can then be evenly distributed among its members. This of course is what happened in the Wire Drawing Mill referred to above, but that alone is insufficient from the standpoint of the employer. Consider the situation pictorially:

Figure 1 Effective working time with different modes of work organisation



With one man-one job, any general increase in labour productivity is limited by the effective working time of employee E: he can spend only another tiny proportion of the working day engaged in labour before he has reached its limit. Group working transcends this barrier by creating a situation where workloads can be equitably shared, and where a much greater general increase in productivity is possible. Group working creates the possibility of higher effort levels, but this possibility must be transformed into actuality by other mechanisms, to which we shall turn in a moment. More generally then it can be said that despite critical references to the 'machine theory of organisation,' and to scientific management,[23] the achievement of sociotechnical theory has been to discover the limiting conditions - high product or process uncertainty - beyond which certain tenets of scientific management cease to be economically effective (see also Chap. 2). It has not discovered any general inapplicability of scientific management principles, such as the individualisation of workloads, because of its, apparently, fortuitious concentration of research in a particular type of industry. Yet in this type of industry we have discerned an economic rationale for autonomous work groups that is present to a much lesser degree, if at all, in other sections of industry. The specification of this rationale as economic is important, for there does exist an argument that there is a technological basis for socio-

technical practice, which we shall examine under the heading of 'Organisational Choice.' [24]

Having said this, it might appear that the one case, referred to above, which did not pass beyond these limiting conditions of product or process uncertainty would seem to refute the judgement just made. In this case a very 'stable' production process, based on specialisation of labour, precise allocation of function, and individual piecework (based on MTM), was transformed into a group working situation in which operators performed between two and four different operations in the week.[25] During the first five months the operators adhered firmly to the pre-experimental norm of output, and there was comparatively little rotation between jobs. This is not surprising given the relative infrequency of 'variations' that were so much sought after by the sociotechnical workers. Finally, on a day when the group leaders "forgot" to correct for absenteeism, collective output remained the same, as the workers coped with the additional workload. From then on, productivity climbed steadily reaching a level 20% higher than the pre-experimental norm. What does this experiment demonstrate? Given the lack of 'variations,' and, apparently, of line-balancing problems, it does not in fact show the inadequacy of one man: one job, and the superiority of group working. The problem here was to break through a social, worker-imposed barrier, not a technical, or organisational barrier (as in the Durham and Indian studies), and several studies

have shown that a variety of techniques, productivity bargaining, for instance, has been used successfully to raise output under such conditions.[26] The break up of output restriction cannot therefore be attributed to any intrinsic feature, or inherent superiority, of the socio-technical approach.

'Joint Optimisation' as Intensification of Labour

Later work in the sociotechnical school has employed the concept of 'joint optimisation' to characterise the conclusions from socio-technical practice. Although both Rice and Trist & Bamforth acknowledged the first step in the argument[27] - that one could not discuss the social and technical systems in isolation since they were mutually interactive - it was not until the publication of Trist's study in 1963 that the next step was added.[28] For effective industrial performance it was necessary to jointly optimise the socio-technical system, rather than to optimise one, let us say the technical system, and therefore sub-optimise the other. This conclusion was presented as both result and description of the early Tavistock work, and has since come to be widely accepted both inside and outside the Tavistock. But what did Rice and Trist actually do in their studies. Did they jointly optimise socio-technical systems? The answer, I would suggest, is that they did not. In both cases the researchers faced a technological innovation which had failed to fulfill its promise: their problem was actually conceptualised as the bringing into line of recalcitrant social systems. Rice was very clear on this point:

> "The effective employment and development of a machine technology demand an appropriate work organisation ..... (The workers)..... must behave in such a way that machine performance is maximised rather than their own..... machines have already become dominant and demand the active development of an appropriate 'culture' where none exists" 29

This emphasis on machine utilisation and the costs of machine downtime is also to be found in Trist et al.[30] and Emery & Thorsrud.[31] But if social and technical systems were not jointly optimised in these studies, what did in fact take place? I would suggest that the actual practice in these cases can best be described as intensification of labour, that is, an increase in workloads, and/or a faster pace of working.

It was argued in the previous section that the achievement of socio-technical theory was to have discovered, albeit implicitly, the limiting conditions beyond which certain principles of scientific management ceased to be economically viable. The manifestation of this was the transition from the individual to the group as the unit of job design, a process which permitted a theoretical equalisation of workloads. The second phase of this process is intensification of labour - the raising of workloads, and/or adoption of a faster pace of work. In connection with this analysis two questions immediately arise: firstly, what evidence is there for such intensification of labour? And secondly, what are the mechanisms by which the process is brought about?

In the first of Rice's innovations between 6.2 and 8.3

workers were theoretically required for 64 looms (the variations reflect different grades of yarn), but in practice there were seven workers in each group.[32] Consequently when coarse yarn was being employed, and loom stoppage increased in frequency, even management had to admit their figures were too 'tight' and required upward revision.[33]

In the second case, with manning reduced by 50%

> "..... there were many complaints of tiredness caused by so much extra walking ..... At all conferences they said that they worked much harder than in the other sheds." 34

The same was true of the Durham coalmining study:

> "The team delegate later expressed the view that their higher income had been due not so much to the nature of the face or the coal ...., as to the fact that they had been working hard and, principally, to the greater co-operation they were able to achieve with the composite work method and the advantage it gave in the way of task continuity." 35

And what was 'task continuity?'

> "No man was ever out of a job. If he finished his hewing or pulling before others he would join and help them, or go on to some other job which was to follow." 36

In the second phase of the wire drawing mill project five workers carried out all of the work previously done by six, an extra workload of 20% for each man; output on panel assembly (which was labour intensive) rose by 20%; at Norsk Hydro a plant which theoretically (according to scientific management theory) required 94 people for its operation, in fact ran with only 56; the additional duties for the operatives included those of the foremen and

chargehands (13 eliminated), maintenance workers (4 eliminated), cleaners (all 12 eliminated). In addition, the number of required operatives was cut from 48 to 40.[37] In the fourth Norwegian case, the Hunsfos pulp and paper mill, the major economic benefit was in terms of product quality, rather than output, whilst in the van Beinum case no changes in work organisation were actually initiated.[38] And in the final, and most recent sociotechnical case study the workers disclaimed any feelings of tiredness, although it does appear there was increased output on the part of the experimental groups, and this is difficult to attribute to anything other than increased effort expenditure.[39]

These facts lend support to the view advanced above that in practice 'joint optimisation' of the social and technical systems, is best understood as intensification of labour. The process has two phases - in the first workload inequalities are ironed out by assigning formal responsibility for all tasks to all members of the group. The second phase is then built on these averaged theoretical workloads, and consists of raising effective working time (task continuity) and/or the pace of working. The technical system, according to conventional interpretations of that term, has not been altered in any of these cases as part of a socio-technical intervention. Rather, it has been taken as given and the objective of all the cases has been to create a work organisation that would extract the maximum use and value from the existing machinery (Rice, Trist) and from the

labour force (Rice, Trist, Emery & Thorsrud).

Has this relative neglect of the technical system, and of its design, derived from the particular situations in which the sociotechnical researchers found themselves, such that one could conceive of genuine socio-technical design? Or do these workers believe they have in fact carried out socio-technical design. The first I believe is nearer the truth, and Herbst in fact argued as long ago as 1966 that the Tavistock studies had taken the technical system as given.[40] In future, both the available technical and social system choices must be listed since technical designs invariably embody certain assumptions about human and social systems, and one of the best examples of such socio-technical design is thought to be the Volvo Kalmar plant in Sweden, discussed elsewhere.[41]

Worker motivation, task performance, and the question of pay.

Having established the phenomenon of labour intensification, we must now consider the mechanisms responsible for bringing it about, in each of the main sociotechnical case studies. According to Trist et al. there were four 'bases' for composite, or autonomous working: composite work method, workmen, workgroups, and payment system.[42] Composite workmen were trained in a variety of skills so they were able to perform tasks as they arose; their workgroups were self-selected, thus facilitating efficient deployment of

labour, and the men were paid on a group basis. Composite work method was the result:

> ".....oncoming men take up the cycle at the point left by the previous shift. When the main task of their own shift is completed they redeploy to carry on with the next,....." 43

Effective working time was increased, as we showed earlier. Of these four features of composite working, the first one, work method, or task continuity as it was called was thought to be "essential." [44] Whilst pay was clearly important, it was but one part of,

> "A comprehensive agreement which commits a corporate group to an overall task, legitimates motivation to improve performance and releases ability to learn." 45

This deprecation of the significance of pay was also evident in the Trist and Bamforth paper, where they discussed the "displacement" of psychological and sociological problems onto economic struggles, and thence onto worker-manager relations. Questions of pay were thus seen as the phenomenal form of expression of more basic, and latent, conflicts.[46]

The relative significance of pay, and of other factors in the work situation, for industrial conflict and performance, cannot be assessed in such a brief space, but we can add two critical remarks about the Trist et al. assertions. On conventional longwalls, as the authors rightly point out, the existence of different pay criteria meant that for any group of specialised workers certain tasks went unrewarded.[47] Minor maintenance, for example, if not the responsibility of Group A, would not be carried out by them since it would only

consume time without simultaneously yielding a financial reward. The effect of the 'composite' agreement was to extend the 'cash nexus' to all tasks for all groups. Every task necessary for the extraction of coal contributed to the final level of pay, and was thus, indirectly assigned a financial reward.[48] But was pay so important that its extension over all tasks for all workers could have such positive effects on performance?

The second point is that under the conventional longwalls pay bargaining had been 'rampant':

> ".....", any request to do anything additional is regarded as exploitation unless separately rewarded." 49

And what was the nature of the situation prior to mechanisation, with the hand got systems? Each marrow group negotiated its own contract with the colliery management, and given the known variability of coal seams, such negotiations would have taken place at quite frequent intervals. And in view of the fairly direct relationship between physical effort and output, the nature of the seam, and the price per unit output would both have been issues of great concern to the marrow group.[50] In other words we can say there was a tradition of bargaining in which pay figured as a major element, both in the hand-got and the conventional longwall systems, and it would be surprising if the effects of such a tradition could have been 'overcome' so rapidly with the creation of composite groups.

The study by Rice underplayed the significance of pay

to an even greater extent than that of Trist. Although the members of the reorganised weaving groups received increases in basic pay (per month) ranging from nil (for new entrants) up to 44%, Rice wrote:

> "It was concluded that the first spontaneous acceptance of the new system and the subsequent determination to make it work were due primarily to the workers' intuitive acceptance of it as one which would provide them with the security and protection of small group membership which they had lost by leaving their villages and their families to enter industry." 51

More decision-making over labour allocation for instance, was assigned to work groups, each worker was to perform a greater variety of tasks, and he would belong to a group which was itself responsible for a whole, and 'meaningful' task. The behaviour of the weaving groups showed variations however that were quite independent of these features, but which did correlate with changes in pay levels and supervisory controls. Before reorganisation only one-third of the workers were on piece wages (8 weavers and 2 jobbers per group of 30 workers) whilst the remaining ten occupational groups were paid time wages.[52] At 85% loom efficiency a certain sum was paid to the weavers and jobbers, and variations around this figure resulted in proportionate gains and losses in pay. After reorganisation, all workers were transferred to an incentive payment system, and on achievement of the 85% norm, all would receive a "small rise in pay."[53] The effects of these incentives on performance were predictable without reference to changed work methods and work organisation: average loom efficiency

rose from below 80% to almost 90% as workers sought to increase their earnings.[54]

The reorganisation was followed up for six months, during which time efficiency was mostly stable, at about 90-93%, and damage at 24%. During November, eight months after the start of the experiment, efficiency began to fall, reaching 77%. The workers protested that the quality of the yarn was poor and thus giving rise to more stoppages, too many in fact for them to cope with. They first requested extra help, and when this was turned down, asked for compensation for loss of earnings.[55] According to Rice, the first request signified a 'task-centred' orientation on the part of the workers, but we are asked to believe that when the request failed, the workers then 'produced' a cash-centred orientation. Was their acceptance of the reorganisation not so thorough-going after all? Or were their attitudes contradictory, a mixture of 'intrinsic' and 'extrinsic' orientations? A far more parsimonious interpretation is available: the workers' requests for extra help, and extra cash, were not 'separate' requests but two sides of the same coin, that coin being the wage-effort bargain.[56] Perceiving an upward drift in effort relative to pay, they first tried to realign the two through effort reduction, that is, by asking for higher manning. When this failed they approached the problem from the other end and asked for more pay.

There was of course a second experiment involving non-automatic looms, in which the changes introduced were rather similar. They consisted of the creation of a group

of workers (eleven instead of twenty-two) responsible for 40 looms, in which the weavers' duties were now divided up among front, back and smash-tent workers. All workers (instead of just the weavers) went onto piece rates, and bonuses were paid on a composite output and quality index. Efficiency was raised from between 40 and 60% to 85%, 70% being the level beyond which bonus was paid, whilst damage fell from 20% to 5%. In explaining these results Rice entirely abandoned any notions of the importance of individual job content, for although,

> ".....the weavers performed an integrated 'whole' task - the conversion of yarn to cloth." 57

> "The amount of time they spent outside the shed suggested that the workers derived no more than a very moderate satisfaction from the efficient performance of their tasks." 58

Therefore,

> "The immediate practical result of the experiment has been to demonstrate that ..... the breakdown of the 'whole' task of weaving into component operations, each performed by a different worker, and the reintegration of the workers into an internally structured work-group that performs the whole task on a group of looms, can be accomplished in one process ....." 59

This is a very clear statement of the Durkheimian analysis of division of labour, mentioned elsewhere.[60] Many of the results of this case, for example reduced costs, derive quite directly from the 50% reduction of manning levels, and more significantly, from the furtherance of the division of labour, and the introduction of output and quality bonuses for all workers.

The arguments advanced in connection with these early case studies can also be applied to the innovations in Norway, and in the USA. In the wire drawing mill, and the panel assembly cases output was not increased until management took advantage of fortuitous absenteeism to 'allow' the groups to cope with their workloads at lower levels of manning. Since both groups were paid under a group incentive system the effect of the managerial oversight was to allow higher individual earnings for greater effort, and the wage-effort levels consequently stabilised at the new levels. In the Hunsfos pulp and paper mill, the main problem was that of product quality, and the reorganisation of work both allowed workers to take more decisions affecting quality, and also gave them an incentive in the form of a bonus tied to quality improvements. The Norsk Hydro fertiliser plant is difficult to discuss because although improved productivity (by comparison with other plants) was achieved by setting lower manning levels, the company tried to attract a highly motivated and able workforce.[61]

The most recent case, in the USA, illustrates once more the saliency of earnings and effort, compared with job content.[62] In this study two autonomous work groups were established in the mine by voluntary participation and selection, and after two years operation (in the case of one group, fifteen months in the other), the autonomous groups showed higher levels of output per day, and lower absenteeism and accident rates. A number of factors however complicate

the conventional analyses. Firstly, as the authors admit, the workers on one of the autonomous groups were "very experienced miners," and thus capable of achieving higher rates of output.[63] But secondly, and more importantly, work in the autonomous groups was paid automatically at the top rates of pay (all the miners were paid time-wages), and of the 29 reasons given by the 24 men who formed the first autonomous group, the most common, mentioned by 7 men, was pay. The attitudes of workers in the non autonomous groups appeared to show a similar concern with wages and effort: in September 1974 the union local (admittedly on a low turnout) voted to create a second autonomous group, i.e. to extend the experiment. In August 1975, the same local on a higher poll, voted to curtail it, as the renegotiated union-management contract had raised the proportion of workers on top rate to higher levels. It appears workers then preferred to stay on their old jobs at top pay, rather than move to the autonomous section for no financial gain.

The evidence in these cases is not unequivocal, since many other changes took place in addition to changes in pay levels and incentives. It is theoretically possible then that the payment changes did not cause the performance changes, but resulted from them, and that performance improvements stemmed from other factors, such as increased job challenge. This interpretation cannot, because of the nature of the evidence, be ruled out, but the interpretation based on payment changes is more plausible, for a number

of reasons. Firstly, it accords with our existing knowledge of the effects of introducing pay incentives. But secondly it is also consistent with the fact that the workers' themselves in these case studies, manifested a concern for wages and effort.

'Organisational Choice' ..... or 'One Best Way?'

The discovery of 'organisational choice' and the corresponding rejection of technological determination of work organisation is often thought of as one of the 'hallmarks' of socio-technical theory. The report of the Durham mining studies carried the phrase as its title, and the idea is implicit in the original socio-technical principle that best economic performance is a function, not of technical, or social maximisation, but of joint social and technical optimisation. It was rendered explicit by the adoption of 'open' (rather than 'closed') systems theory, and the implication of this view was that systems possessed the property of 'equifinality' - a 'steady state' may be reached from different starting points and in different ways, hence there exists 'organisational choice.'[64] The principle was again reaffirmed in the report of the Norwegian case studies.

But a question mark can be placed against the meaning of the phrase 'organisational choice' - choice with respect to what criterion? Does it mean that, theoretically, assuming no economic constraints, several forms of work

organisation are possible for a given technology, and that each could achieve the economic objectives of the enterprise? Or does it perhaps mean that whilst several forms are possible, some are more effective than others? This ambiguity has been expressed by Susman[65] and also by Hunt:

> ".....since tasks vary, there can exist no one best way of organising . . . . (and the coal mining study was a . . . .demonstration of different, but all successful, spontaneous, organisational task-shift rotation systems in British coal mines ....."
> "It does not follow from this, of course, that for a given set of tasks or a particular task environment, some organisational forms may not be better than others. It is by no means clear, for instance, from the example just cited that each of the three task-shift rotation systems ... was equally 'good' from all stand points. It can only be claimed that each was 'successful'." 66

To describe both conventional and composite longwalls as 'successful' surely misses the whole point of Trist's book. The studies which he conducted showed that under all conditions observed composite longwalls performed better than conventional longwalls on all measurement criteria. Whilst Trist et al. hesitated to describe composite working as the 'one best way' of organising longwall technology, claiming merely that it was 'better adapted,' their recommendation for composite, or autonomous groups, has been gradually transformed into a universal prescription, not least by Trist himself.

An explanation of this ambiguity in the sociotechnical work can however be offered. The Durham coal mine and Indian textile studies were interpreted as supporting the principle of 'organisational choice' against the supposed,

technologically determined one best way of Taylor, which consisted of specialisation of labour, and one man: one job allocations. And the Norwegian work was thought to have confirmed the principle once again (or four times again). But if we examine the studies we find, as we have noted above, that composite, or autonomous group working has consistently been found superior to one man : one job allocation, and it was suggested that the achievement of sociotechnical theory was to have shown the limiting conditions (product and/or process uncertainty) beyond which group working was superior to individualised work roles. We may now take this suggestion one step further: within the limitations of current technology and scientific knowledge, the sociotechnical workers have discovered the best way (economically, that is) of organising work in certain kinds of technology. This is not to say they have found 'the best way' for all time: technological or scientific developments may overturn their work, but that is true of any theory. But there is nothing in any of the sociotechnical studies to suggest that several work organisations are equally effective, both economically and psychologically, for a given technology. Their research findings all point in the direction of a hierarchy of effectiveness, with autonomous, or composite groups, as the most effective form of organisation for technologies which entail product or process uncertainty. The content of Taylor's theory - one man : one job - has been abandoned, but the form - one best way - has been retained.

Summary and conclusions : sociotechnical systems theory

(1) The studies of Rice and Trist (and to some degree the Norwegian work) were interpreted at a general level in terms of social system adaptation to technological change, a process which despite the commitment to work group autonomy, often involved a severe curtailment of worker autonomy - over job rotation in India, over cavilling in the Durham coal mines, and over manning levels in the Norwegian wire drawing mill - and a subsequent subordination of work autonomy to economic imperatives. The technical system was thus taken as given.

(2) It was suggested that the sociotechnical studies could be seen as attempts to transcend the limitations of one man: one job allocation in order to maximise utilisation of machinery and of labour. The achievement of the research was to locate (implicitly) the limiting conditions (product or process uncertainty) beyond which one man : one job allocations became less effective than group working.

(3) The joint optimisation of sociotechnical systems was reinterpreted, in the light of the case studies, as a form of intensification of labour. The phenomenon proceeded in two phases: (a) group

responsibility for a set of tasks theoretically averaged and equalised individual workloads as a precondition for, (b) a general raising of workloads. Both forms of labour intensification - higher workloads, and faster pace of working - were seen to have occurred in the sociotechnical case studies.

(4) It was argued that the significance of pay incentives, as a mechanism of labour intensification, had been greatly under-estimated in the sociotechnical writings, and that changes in output and product quality could be accounted for more plausibly and parsimoniously by reference to changes in pay incentives (and in some cases, in supervision).

(5) It was suggested that although, at a theoretical level, some sociotechnical workers have counterposed 'organisational choice' to the 'machine theory of organisation' with its 'one best way,' others have argued for autonomous work groups as if these comprised simply a new 'one best way.' In practice, it was argued that sociotechnical research had demonstrated the superior effectiveness of one particular form of work organisation - autonomous work groups. Although the content of one aspect of Taylorism - one man : one job - has been abandoned, the form - one best way - remains.

Summary of conclusions: theories of Taylorism and job redesign

The main comparative conclusions on these theories can be summarised fairly briefly. Job 'enrichment' and task design theories have both lost sight of the socio-historical and economic theory of output 'restriction' advanced by Taylor, and reiterated by a number of industrial sociologists (although Herzberg did acknowledge a subsidiary role for pay rises).[67] In its place they have put a theory focussing on division of labour and job content, areas which received inadequate attention from Taylor. Consequently the mechanism of job redesign is fundamentally quite simple, whereas Taylor advocated a variety of mechanisms, predominantly extrinsic in character, although he also acknowledged "intrinsic" factors in work motivation. On the other hand, socio-technical systems theory perceived production shortfalls as consequences of organisational failures, which themselves had social, psychological, and economic consequences. It should be acknowledged however that a number of job redesign theorists have recently begun to reflect on the significance of pay.[68]

Taylorism also placed some emphasis on promotion opportunities, a point neglected by task design theory but not by job enrichment and sociotechnical theory.

Where Taylorism sought to reconcile employer and worker interests at economic and psychological levels, job redesign theories (with the exception of sociotechnical theory) have established a disjuncture between these levels, and concentrated on the latter.

Whilst job redesign has reversed several divisions of labour, we saw that Taylorism was not necessarily incompatible with these processes since specialisation was not one of its integral components. Again, job redesign has often sought to enhance workers control over immediate aspects of production, but since control should not be seen as a zero-sum concept, this process could occur simultaneously with an increase in managerial control at higher levels. Finally, the individualism of Taylor has been continued by task design and job 'enrichment' theories, although abandoned by socio-technical theory in the face of new, and different economic and technological conditions.

Several conclusions can also be drawn at a more general level: firstly, it cannot be maintained that job redesign theories have a simple and single relationship to Taylorism, since there are striking differences between them; secondly, it cannot be argued that any job redesign theory has abandoned, or overthrown, Taylorism, in any overall sense. Indeed all of them have preserved elements of Taylor's theories. Herzberg's job 'enrichment' has retained both the individualism, and the stress on promotion opportunities; task design theory has sought to reduce work role inter-dependencies; and socio-technical systems theory has retained, at a formal level, the notion of there being one best way of organising work, as well as an emphasis on the role of payment systems and levels.

This is not to deny that elements of Taylorism have been abandoned. All theories of job redesign have failed

to indicate the rational basis underlying output restriction; some have paid insufficient attention to the role of pay in motivation; and some have not looked at jobs, and promotion prospects, over a period of time.

Fourthly, it should be acknowledged that in their stress on job, or intrinsic, motivation, and on reversal of division of labour, all three theories of redesign have gone much further than Taylor, although they are not advocating themes that were totally absent from Taylorism. Socio-technical systems theory should be singled out here since it has tried to incorporate features of technology and organisation into a broad theory of job redesign and organisation of work roles.

It cannot be said, finally, that only the more inadequate (theoretically or practically) features of Taylorism have been allowed to lapse into oblivion, and the more valid insights retained in job redesign theory. For Taylor's important insistence on the role of pay in industrial motivation, and his attempt to adumbrate a rational basis for output restriction have both been echoed by a number of significant, contemporary writings in industrial sociology (see next chapter).

NOTES AND REFERENCES

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4. Emery, F.E. 1959, Pt. 11.
The point about lack of definition of terms has also been made by van der Zwaan, op. cit.

5. Engelstad, P. 1972. Rice, A.K. 1958.

6. Emery, (1959), op. cit., p. 6.

7. Trist et al., (1963), op. cit., p. 6.

8. Trist & Bamforth, 1951.

9. Trist et al. (1963), Chaps. 13, 26.

10. Rice, A.K. Productivity and Social organisation in an Indian weaving shed. Hum. Relats., 6, 297-329, 1953; Rice, A.K., (1958), op. cit., Rice, A.K. The Enterprise and its Environment. London, Tavistock, 1963, Chaps. 3, 4, 9, 10; Miller, E. Socio-technical systems in weaving, 1953 - 70; a follow-up study. Hum. Relats., 28, 349-86, 1975.

11. Emery, 1959.

12. Emery, F.E. & Thorsrud, E. 1964, 1975; Gulowsen, J. 1973; Thorsrud, E. 1967; Thorsrud, E. et al., 1976; Engelstad, 1972.

13. Trist, et al., 1963.

14. Trist & Bamforth, 1951, pp. 6-7; Trist et al., 1963, op. cit., pp. 34-5.

15. ibid.

16. ibid., pp. 105, 195-210, 251-6, 270-1, 293-4.

17. Emery & Thorsrud, 1975, p. 30.

18. Rice, 1958.

19. ibid., p. 241

20. Rice, 1963, pp. 286-8.

21. At least one writer has used facts such as these to characterise the autonomy of sociotechnical theory as a "false praxis," that is as social action subordinated to an imposed economic rationality, Hales, M. 1974A.
Whilst this criticism has a certain validity, as indicated above, it is nevertheless one-sided since there are cases - as in the wire drawing mill, above - where workers have used the concession of autonomy to further their own, immediate objectives - for a more rational and equitable work allocation - rather than those of their employer. See Wood, S.J. and Kelly, J.E. 1978.

22. Emery & Thorsrud, 1975; Rice, 1958, 1963 Trist et al., 1963, Trist, E. et al., 1977; van Beinum, H.J. 1966.

23. Davis, L.E. 1972c, Emery, 1959, Rice, 1958 Trist, E.L. 1976.

24. Davis, 1972a, b.

25. Emery & Thorsrud, 1975, Chap. 5.

26. e.g. Owen-Smith, E. 1971.

27. Rice, 1958; Trist & Bamforth, 1951.

28. Trist et al., 1963.

29. Rice, 1958, p. 241

30. Trist, E. et al., 1963, Chap. 27; 1977, p. 209.

31. Emery & Thorsrud, 1975, Chaps. 3, 6.

32. Rice, 1958, p. 67.

33. ibid., p. 90.

34. ibid, pp. 146-7.

35. Herbst, P.G. 1962, p. 79.

36. ibid., p. 6.

37. Emery & Thorsrud, 1975, pp. 41 ff, 75-83, 88.

38. van Beinum, 1966.

39. Trist et al., 1977, Mills, T. 1976.

40. Herbst, P.G. 1974, Chap. 1.

41. Kelly, 1978c.

42. Trist et al., 1963, Chap. 9.

43. ibid., p. 77.

44. Trist, E.L. & Murray, H. 1958.

45. Trist, et al., 1963, p. 85.

46. Trist & Bamforth, 1951.

47. Trist, E.L. 1956, p. 13.

48. For two recent reviews which examined the effects of financial incentives, see Lawler, E.E. 1971; Marriott, R. 1968.

49. Trist et al., 1963, p. 85.

50. ibid., pp. 36-7.

51. Rice, 1958, p. 110

52. ibid., p. 55

53. ibid., p. 68

54. ibid., p. 76; see also Roy, S.K. 1967.

55. ibid., pp. 88-89.

56. Baldamus, 1961.

57. Rice, 1958, p. 163.

58. ibid., p. 121

59. ibid., p. 166

60. See Kelly, J.E. 1978c.

61. Emery & Thorsrud, 1975.

62. Trist et al., 1977.

63. ibid., p. 221.

64. Emery, 1959, op. cit., Chap. 1.

65. Susman, G. 1976, p. 166

66. Hunt, R.G. 1976.

57. Roy, D. 1952; Klein, 1964. See also Handy, 1968 on absenteeism.

68. Locke, E. et al., 1976; Walton, 1974

CHAPTER 5 TOWARDS A THEORY OF JOB REDESIGN

Introduction

In Chapter 4, on sociotechnical systems theory, it was argued that the major propositions of the theory were inadequate to account for the actual events and outcomes in the case studies from which they were supposedly derived. In terms of developing a general theory of job redesign, two ideas presented in the chapter are of considerable significance. The first is the concept of intensification of labour, and the second is the notion of the wage-effort bargain and the saliency of pay rises and pay incentives. Both of these themes will be expanded in the latter section of this chapter and combined with conclusions and insights taken from earlier chapters. This section will attempt the construction of an alternative theory of job redesign, and will thus bear directly on the four issues to which this thesis is addressed, namely the origins of job redesign, work motivation, the attitude - performance relationship, and the consequences of job redesign. The literature review and case studies (Chaps.6,7,8,9,) will thus be able to assess not only the adequacy of existing theories, but of the alternative to be developed in the present chapter.

The sources for such an alternative are various: incongruities and problems in the existing literature and theories; insights taken from industrial sociology, and

from Taylorism: and developments in case studies in which I have been involved. All of these sources will be pursued, and discussed, more extensively below. But the search for an alternative theory of job redesign also has a more profound origin. That origin is a basic scepticism about the possibilities of ameliorating work conditions and job attitudes in our society. Job redesign challenges such a view and holds out the possibility of significant changes and 'improvements' in attitudes to work. Further than this, it suggests that the goals or interests of workers and employers can be reconciled to a significant degree, and divisions of labour reduced. Such a view is contrary to what has been described as the more 'stoic, bleak, and pessimistic' position of Baldamus, centred around worker-employer conflict and the wage-effort bargain.[1] The optimism exuded by job redesign theorists has not gone unchallenged, and many writers, some from within trade union movements, have sought to produce criticisms and critiques of its theory and practice. In principle such works ought to prove a rich source of ideas that could be used to develop an alternative theory, and it is for this reason that the first section will examine them in some detail.

Broadly speaking, two sorts of criticism have been made. The first set, which I have called 'radical' criticism, seeks to defend the view that job redesign is either not in the interests of workers, or is actually contrary to those interests. This type of criticism is of particular relevance

to the fourth issue raised in Chapter 1 as a central concern of this thesis. The second type of criticism I have called 'theoretical,' and consists in part of an attempt to reinterpret the findings of job redesign practice in ways that are at variance with major aspects of job redesign theory. This type of criticism bears particularly on two further issues identified in Chapter 1, the mechanisms of motivation, and the attitude-performance link. A second type of theoretical criticism can be found in some recent French industrial sociology where it has been argued that job redesign is in fact a contemporary form of Taylorism, rather than its negation. This argument, of course, bears directly on the first proposition identified in Chapter 1. The distinction between radical and theoretical criticism is not intended to suggest that the former has nothing to say on theory, whilst the latter is inspired by political conservatism. There is, almost inevitably, some overlap, but not so much as to render the distinction either meaningless or invalid.

Radical criticism of job redesign

The notation 'radical' refers to critics writing from a trade union or other pro-worker standpoint. This section will cover articles from a number of different sources: academic journals, such as Sociological Review and International Labour Review: trade union and labour magazines, such as the American Federationist (journal

of the AFL - CIO) and Monthly Labour Review; and radical journals, such as New Left Review and Review of Radical Political Economics. In addition a number of well-known books have been referred to, for example those by Braverman, Fox and Gorz. It should be noted however that no complete survey of trade union journals in the U.K., U.S.A., France, or elsewhere has been undertaken, since it was not the object of this section to summarise trade union opinion. Rather I have tended to rely on a number of well-known statements of national union federation positions.[2]

This section will nevertheless indicate the range and content of radical criticism. The selection is representative of the most well-known of such criticisms of job redesign, but in the absence of any systematic survey of trade union opinion, it cannot be seen as necessarily representative of trade union attitudes as such.

There also exists criticism of job redesign in the literature of management, and in fact the major articles to be discussed under the heading of theoretical criticism originally appeared in management periodicals. These articles however were not concerned to examine job redesign in terms of whether it benefits management, but sought rather to challenge the theory of redesign. Whilst there may be material asserting that management gains little from job redesign, I have not encountered any such literature.

Broadly speaking radical criticisms of job redesign may be divided into four categories: the first claims that job redesign is limited in scope, trivial in application, or both; the second argues that whilst job redesign may appear to be concerned with job satisfaction and so on, in reality it is a means for raising profits, reducing costs etc.; the third group of criticisms focuses on the supposed negative consequences of job redesign and the fourth argues that job redesign can best be seen as a new form of control over labour. These types of criticism are by no means exclusive, either in theory or practice, but they are analytically separate, and will be treated as such.

Limited nature and scope

A number of writers have described many of the changes introduced under the rubric of job redesign as 'trivial,' or minimal. Braverman,[3] and Zimbalist,[4] indeed refer to job redesign as a 'cosmetic' : a change designed to appear dramatic but which is in fact insignificant according to some criteria. A similar point is made by Nichols and Beynon, writing in the field of industrial sociology, who quote one worker in their study as saying that job redesign simply involved "moving from one boring, monotonous job to another boring, monotonous job."[5] And Dickson, in a critical study of technology and its social context referred to job redesign as the concession of "insignificant decisions."[6]

All of these criticisms presuppose some notion of significant, or meaningful change, and presuppose, furthermore that this notion is an appropriate standard by which to judge the results of job redesign. The notion in question, for all these writers, is the abolition of the mental-manual division of labour, and against this criterion job redesign probably would seem trivial in the sense intended. But even "trivial" changes (assuming them for the moment to be such) may have very real, and not so "trivial" consequences as we shall see later, and insofar as this type of criticism discourages any further analysis of the phenomenon of redesign, it is destructive and contributes little to our understanding.

A more elaborated version of the triviality argument, advanced by writers such as Banks,[7] Braverman,[8] Cooley,[9] Barbash,[10] Elliott,[11] Hales,[12] Hughes & Gregory,[13] is that it ignores or minimises the question of power and authority. Were such issues to be considered, the argument runs, job redesign would soon be exposed as a means for securing or augmenting the power and authority of managers against those of the workers. Equally, it would be seen that the changes in control and autonomy arising out of job redesign were relatively minor in comparison with the enduring distribution of power. It is in fact true that most theories of job redesign have paid little attention to this problem, although a number of case studies, such as that of Trist et al.[14] indicate very clearly the way in which worker

control could be subordinated to managerial interest. Whilst the question of changing forms of control is important for understanding certain forms of job redesign (such as individual assembly) and certain outcomes (improved quality of product, for instance) this is by no means generally true. In any case, although such critics have pointed to an omission in the job redesign literature they have not clearly spelled out the way in which theories of job redesign might be altered by its consideration, or the manner in which power and authority relations operate under job redesign.[15]

Another approach to the critique of job redesign is to minimise its significance, not, as above, by pointing out its 'cosmetic character,' but by elucidating the limited circumstances under which it could, in fact, be applied. Presumably then, if the technique can only be applied very rarely, we can absolve ourselves of the necessity to pay it any serious attention. Levitan & Johnston[16] are the foremost exponents of this mode of criticism, pointing out, for instance, that manufacturing industry, source of many job redesign innovations, is in decline, that there are economic constraints on the reversal of the division of labour and that certain technologies and products may not be conducive to the application of job redesign. Some of these points are, in fact, incorrect: job redesign has been widely applied in offices, as we shall see, and given the relative absence of technology, its

application there is considerably easier than in industry. Nevertheless Levitan & Johnson fail to specify (not surprisingly) the sort of technology in which job redesign could not be applied, an omission due to the fact that no such tecnology has been shown to exist.[17]

The economic limits to job enrichment have been raised by many writers, such as Gomberg,[18] Friedmann,[19] and Braverman.[20] That reversal of division of labour is subject to diminishing returns beyond some point is indisputable,[21] but when we consider, for instance, that one survey reported 55% of jobs in 1200 U.S. manufacturing companies to have cycle times of five minutes or less, it seems difficult to describe this as a serious limit on job redesign.[22]

It has also been suggested that few workers are interested in job redesign, or that job redesign only works where the employees have 'positive attitudes.'[23] The latter point, of course, begs the question of whether the introduction and discussion of job redesign may not, in itself change attitudes - a comment which applies with equal force to the first point (above) and which has been pursued in more detail above (Chap. 3). There is a complement to the triviality argument, proposed by Zimbalist,[24] and more explicitly, by Bosquet,[25] which errs in the opposite direction. According to these writers job redesign contains an inherent dynamic towards increased autonomy and participation, and is thus potentially subversive of the objectives it was designed originally to achieve.

This view arises out of a misunderstanding of the notion of 'autonomy,' and of its false equation with an embryonic form of workers' control. Workers are granted autonomy only in the sense that they are allowed to make certain decisions about their immediate work. At the same time this autonomy is limited insofar as the decision - making criteria are imposed by management, and reflect their own interests, and not necessarily those of the workers involved. There is also, in these writers, a tendency to conflate redesign and participation: job redesign may involve decision-making on specific issues according to specified criteria, but participation can be seen as a more open-ended process in which ideas are proposed and discussed, and where the 'structure' is much looser and less constraining than job redesign.[26] Finally, Bosquet's positive evaluation of job redesign stems from an overly negative description of the factory, pre-redesign, as a 'prison,' or a 'barracks,' containing 'despotic power.'

Appearance and reality

Despite the rhetoric about job satisfaction, quality of work life, work humanisation etc., job redesign is 'in reality,' a managerial strategy to raise profits and reduce costs. This is the conclusion advanced by writers such as Rasmus,[27] Hales,[28] Banks,[29] Hughes & Gregory,[30] Rosenhead,[31] Blackler & Brown,[32] or alternatively, job redesign is

motivated, not by an abstract desire to provide satisfaction for employees, but to reduce turnover, and hence training costs, for the company.[33] The rhetoric of job redesign is therefore a 'con,' a mystification, or an ideology which obscures its true purpose. This argument is in fact linked to the view that job redesign per se is trivial in its consequences for workers, for if the talk of job satisfaction and so on is simply, or largely, rhetoric, then it follows that job satisfaction is not substantially increased, and job content not dramatically altered.

This thesis sounds, and is written as quite radical: it attempts to counterpose the true purpose of job redesign to its stated objective, that is, to demystify the latter.[34] The first problem with it however is that it is almost impossible to discover any statement in the literature to the effect that job redesign is chiefly or exclusively about job satisfaction. From Herzberg onwards, job redesign theorists have openly proclaimed that their techniques would simultaneously benefit both workers and employers, and the theme is to be found in the writings of the sociotechnical and task design schools, as well as in numerous case studies.[35] There is, in fact, nothing here to 'demystify' - it is all out in the open. Because the radicals' argument is so far off beam here, the result is that they do not in fact confront the central problem: does job redesign benefit both workers and employers, and if so, how? Where this problem is recognised, as by Rasmus for instance,[36] it is

usually solved by an appeal to the triviality argument- showing that workers get little out of job redesign - and by a presentation of 'the facts' about productivity increases etc. - proving that employers derive enormous benefits. In this way the unequal, or asymmetrical division of benefits is preserved.[37]

But a more serious deficiency of this approach is that it sets up a false problem - a disjuncture between intention and action - and provides a worthless solution. This disjuncture, does not in fact exist, hence the false nature of the problem. More sophisticated advocates of this approach claim that the subjects of interest to employers and employees are not only different, but exclusive. Employers are concerned with costs, productivity etc., whilst workers are concerned about such values as growth etc.[38]

It is almost certainly true that employers will, in practice, tend to subordinate 'humanistic' values to hard, economic criteria (at least where they conflict), and it is equally true that until recently many cases of job redesign employed rather crude criteria of employee attitudes and interests, such as job satisfaction measures. But whilst these points are valid, there is a danger in drawing too sharp a distinction between worker and employer interests. Consider for example, the issue of productivity which seems at face value a clear instance of a 'managerial' criterion. It can be argued here that workers also have an interest in raising productivity since this will permit the negotiation

of higher earnings, and thus result in increased living standards. There may be more scope for disagreement over the methods by which productivity is to be raised, whether through increased labour intensity, more efficient work methods, or the use of machinery, and over the distribution of the benefits. But to label productivity per se as a managerial criterion seems unwarranted, (see also Chap. 2 above for more on this point).

The negative consequences of job redesign

The list of such consequences is very extensive indeed, and includes such items as : reduced promotion opportunities, reduced supervisory and maintenance staff, increased workloads, the creation of a dual labour market, redundancies, job insecurity, deskillation, increased exploitation, inequitable pay rises, prevention or inhibition of trade unionism, division of the workforce, and destruction of the seniority principle.[39] Rather than comment in detail on all of these points, I shall try to distinguish those consequences which are necessary features of job redesign from those which are contingent on particular conditions or circumstances. Elliott, Zimbalist, and Rasmus have all argued that opposition to unionisation is a significant factor in job redesign schemes, a conclusion based on a false identification of job redesign with the virulent anti-unionism of Herzberg and Myers.[40] In fact, as we shall see below, the majority of such schemes have occurred in unionised plants, and anti-unionism is not therefore a necessary feature of them.[41] A similar argument applies to pay rises: in the majority of cases they have been given, and there is in fact an increasing trend in this direction.[42]

Destruction of the seniority principle of promotion, discussed by Daniel, Rasmus and Tchobanian,[43] is again not an inevitable consequence of job redesign: some theories of

motivation do, nevertheless contain a threat of this sort, insofar as they argue that pay and promotion should be tied closely to performance. Younger, and faster, workers may therefore receive promotion in preference to older workers, hence the fears about a dual labour market.[44] Equally, it has been argued by Banks, Hughes & Gregory, Nichols & Beynon, Rasmus, and Tchobanian[45] that job redesign may result in increased workloads, and hence higher effort levels, a point that will be taken up below in some detail.

A number of general observations can be made about these points since at this stage we are not yet in a position to evaluate them in detail. Firstly, some of the observations are undoubtedly correct: the analysis (in Chapter 4) of sociotechnical systems theory suggested that increased workloads (or intensification of labour) was a necessary aspect of sociotechnical practice. Secondly, the critics who have raised this, and other points have unfortunately not linked their points, with sufficient precision to an overall theory of job redesign. It is thus difficult to know which of these negative consequences, if any, are inherent in job redesign, and which of them contingent on situational characteristics. Thirdly, there has been a tendency in this literature to talk about job redesign in general, and to pay little attention to the different <u>forms</u> which the phenomenon might take.[46] Negative consequences that are necessary features of one form may only be contingent aspects of another.

Control over labour

Finally, several writers have argued that job redesign should be seen as being predominantly a strategy for enhancing, or restoring, control over labour, a view taken by Gorz,[47] Friedmann,[48] Rasmus[49] and Wedderburn.[50] Traditional strategies of control, such as direct supervision are said to be failing, a fact evidenced by the increased militancy and struggles of labour, and thus new, and more sophisticated strategies are required. Gorz indeed suggests that the success of job redesign in showing the possibility of "workers' control of technology and work organisation," proves the redundancy of supervisors, foremen etc., except for purposes of authoritarian control.[51]

In fact, job redesign has rarely been implemented in a strife-torn plant (as Gorz later conceded), and many of the cases, as we shall see, have involved women, traditionally a less militant section of the labour force. More seriously however this type of critique appears to elevate control over labour to an end in itself when it is surely more accurate to say that labour control is but a pre-requisite, albeit an essential one, for attaining economic objectives, such as profitability, efficiency etc.

* * * * *

Radical criticism of job redesign has offered a number of potentially useful insights and observations into the

phenomenon despite having also made frequent unwarranted assertions, and having failed to distinguish its different forms. The claim that job redesign theorists have neglected its implications for power and authority, is a useful one insofar as it alerts us to the possibility that there may be more involved than a simple increase in worker "autonomy." Nevertheless, underlying all the deficiencies of the radical criticism is a failure to explicate a coherent and adequate theory of job redesign. Without such a theory, or at least a model, it is impossible to tell, for instance, whether higher workloads are a necessary or a contingent feature of redesign.

Some attempts have in fact been made recently to challenge job redesign at a more explicit theoretical level, and it is to this criticism that we now turn.

Theoretical criticism of job redesign.

Broadly speaking four types of criticism have been made: the first asserts that surveys of job attitudes show there is no widespread interest in, or desire for, job redesign; the second, which is really an extension of the first, claims that there are satisfactions to be had from repetitive work, contrary to the views of job redesign theorists; the third criticises the motivation theory which lies at the core of job redesign, and proffers alternative explanations for the various economic outcomes; whilst the fourth has reconceptualised job redesign as a form of Taylorism.

The first two sets of criticism have already been dealt with, under the heading of 'Individual Differences' (see Chapter 3), and I will only repeat the main points here, before commenting on some recent work. The argument that workers are satisfied with their present jobs tells us nothing about their likely response to redesigned jobs, and specifically, we cannot infer that they do not want, or would not respond favourably to such jobs, for a number of reasons. Firstly, it appears that workers do 'adapt' their expectations to what is available on the market, or in a plant, so that if the availability of redesigned jobs increased, it is possible that expectations could rise accordingly.[52] Secondly, whilst it is true that there are specific satisfactions to be had from repetitive work, as Baldamus,[53] Smith & Lem,[54] and Turner & Miclette[55] have shown, this in no way excludes the possibility that workers would not respond positively to jobs which, though not repetitive, offered different sorts of satisfaction. Indeed a proportion of workers in the Conant & Kilbridge study expressed a liking <u>both</u> for paced, assembly line work (because it was easy etc.), <u>and</u> for individual, bench work (because of the autonomy and variety)[56]. We cannot assume then that workers hold a single, and coherent set of values with regard to jobs,[57]

The third type of criticism strikes at the heart of job enrichment, and therefore requires more detailed consideration. Parke & Tausky,[58] Fein,[59] and Locke[60] have

all suggested that whilst job redesign "works," in the sense that it does lead to higher productivity, product quality etc., this is not for the reasons given by the conventional theories, but for altogether more traditional reasons, such as pay incentives and supervisory control. As Parke & Tausky have put it:

> "To presume that the average employee without prodding by rewards and penalties, will spontaneously and consistently exhibit work effort directed toward organisational goals is utopian." 61

and in a later article they wrote that,

> ".....in job enrichment programs, work standards and accountability are characteristically designed into the situation ..... When such is the case, to hold the job requires that the scheduled, specified tasks be accomplished..... Given accountability, only one assumption need be introduced, namely, that the benefits of the current job are salient to the worker; no further assumptions about higher order needs are required." 62

These are the three elements of the Parke & Tausky interpretation: specified workloads, pay,and supervisory controls. To illustrate the operation of these principles they refer to a number of cases: quality improvements by clerks at A.T.& T. were attributed to better accountability, rather than more 'autonomy' for the clerks. The improved performance of janitors at Texas Instruments was explained, not in terms of Herzbergian motivators, but of the large pay increase and the tighter control exercised by management. Quality improvements at Motorola, Maytag, Corning Glass, and Donnelly Mirrors were attributed, not to employee responsibility, but

to better accountability. And finally improved performance at Gaines Pet Foods was explained, not by the autonomy inherent in the new work groups, but by the group pressure exerted on group members to reduce absenteeism.

A similar series of arguments were advanced a number of years earlier, by Fein, and reiterated approvingly by Gomberg.[63] Whilst pointing to the efficacy of pay incentives, as at Texas Instruments, Fein also pointed out that employees at Gaines Pet Foods, for instance, were highly selected. 625 applications were received for jobs in the new plant, and only 63 were accepted, whilst at Texas Instruments, the wording of the advertisements, and the rates of pay, were such, according to Fein, as to attract more highly motivated and skilled employees. This argument clearly limits the general applicability of job redesign findings, but there is no reason to suppose the majority of cases are of this type, since few have been conducted in green-field sites.

Parke and Tausky's work was written as a theoretical critique of job redesign: they sought to attack 'need' theory, and to substitute expectancy theory which postulates that people have preferences (rather than needs), that they have expectancies of various behaviours, and of their consequences, and that behaviour is a function of preferences and expectancies. Since then, most people want money, and perceive that working hard and well brings money, then to that extent they will tend to work hard. Shorn of the

language of expectancy theory, this view could be seen as a contemporary restatement of Taylor's theory of motivation with a processual supplement in which pay, the reward for work, was an important element, in addition to managerial controls.

Fein, on the other hand, was more explicit about the content rather than the process, of motivation: job content was only one of a number of elements determining 'the will to work,' others being pay, job security, and the absence of restrictive rules and regulations. At a more general level, workers are satisfied to the extent that they can exercise choice - over what job to take, and over its content and conditions once taken. In a later article, the importance of pay was given a meaning aside from that of its purchasing power:

> "When management establishes a job enrichment program to involve its employees in job improvements, it violates a basic principle of job evaluation. Employees are encouraged to work at higher skill levels than those for which the job was evaluated." 64

The arguments about pay, control and work standards are essential for understanding several forms of job redesign, as we shall show in the next chapters. But they are only three components of a theory of job redesign, for a substantial minority of cases have not involved pay rises, whilst a greater number have, seemingly, not instituted

new forms of control. This should not however detract from the Parke & Tausky work, for it is an important beginning in the construction of a theory of job redesign, a task which forms the principal object of the next section of this chapter.[65] Prior to that however we must consider the final theoretical criticism of job redesign, namely that it constitutes a contemporary form of Taylorism.

A number of French writers have addressed themselves to this problem of the relationship between Taylorism and job redesign, specifically to try and understand why contemporary capitalists have been able to reverse so dramatically such integral features of production as division of labour, hierarchical control, managerial authority etc. Since these are the only major contemporary analyses of the relationship between these two 'schools' of management, it is important to examine them in some detail.

Palloix has argued that contemporary job redesign initiatives cannot be seen as a genuine rejection of Taylorist and 'Fordist' methods of organisation.[66] Taylorism he takes to consist of the principles of: separation of execution and conception, specialisation of labour and time study; whilst Ford adapted these principles, adding two of his own: the introduction of the flowline principle, and the use of a day wage (instead of piece rates). Job redesign does not call the division of manual and mental labour into question, "because it builds into the functioning of the small work groups the fact that they are a

subordinate part of the collective workers." As for 'semi-autonomous work groups,' the work of Bernoux & Duffier is used to show that, despite their introduction, the experience of exploitation remains unchanged, and even in the Volvo/Saab experiments the continued existence of contralised, managerial control, signifies the persistence, not the abandonment, of Fordism.[67] What Palloix is saying then is that whatever the significance of changes in job content, capital remains in control, and workers are subordinate to its objectives. This is a pity because in the earlier part of his article Palloix has formally outlined the Marxist theory of surplus value, of necessary and surplus labour time, and has explicated the concepts of relative and absolute surplus value. He then proceeded to examine various methods of raising productivity, such as increasing workloads (intensification of labour), and one would thus have expected a much more profound and thorough analysis of job redesign than has actually been given. Indeed, there seems to be a complete disjuncture between the early, theoretical part of his article, and the later, more concrete section. His observation on the Kalmar project is one that I would accept, but the discussion of Taylorism is flawed by an inadequate conceptualisation, despite reference to the more sophisticated work of Montmollin. There is in fact, as we have established, far more to Taylorism than specialisation of labour and time study, a point of which Montmollin is aware,[68] (see Chap. 2).

His analysis, attempted to prove that job redesign was a new form of Taylorism, by drawing out the general principles of both innovations, and comparing them. Taylorism he characterised in terms of: division of labour between execution and conception, rationality, order and harmony, individualism, and productivity. To his credit he recognised that horizontal division of labour was not an integral feature of Taylorism - " .....pour Taylor la parcellisation des taches, le travail en miettes , n'est pas essentiel a l' O.S.T." Although a common 'symbol' of Taylorism, "... c'est un symbole inexact quant a son ideologie." The search for and belief in, the 'one best way' was seen to be the highest expression of Taylor's rationalism. If we turn to job redesign, what do we find? There is a similar concern for productivity, and for order and harmony.

> "Les nouvelles formes d'organisation du travail, de meme que les anciennes, ne peuvent s'accomoder l'existence de contradictions, de luttes et de conflits... Il peut y avoir malentendu, non opposition." *

Collective bargaining, or rather negotiation, was accepted, in contrast to Taylor, but "..... elle conserve un objectif d'explication, non de compromis," - "it serves as a vehicle for (managerial) communication and not for bargaining." As regards division of labour, job redesign (anti-Taylorism) rejects horizontal division of labour, which is not in any case fundamental to Taylorism, but accepts the execution/

conception distinction, which is. Rationality too characterises the contemporary movement, which can be seen as a socio-psychological supplement to Taylorist ergonomics, and finally, productivity is a goal common to both.

There are a number of inaccuracies in Montmollin's account, although none of them serious. He writes, for instance, that in Taylor's view of conflict,

> "Tout conflit, toute contradiction procedent de l'ignorance qui ne sait pas raisonner clairement, ou de l'aveuglement coupable de ceux quiegarent leurs passions." **

In fact Taylor adhered to a rational-economic theory of conflict, based on separate interests, as we saw above. However, let us consider the substance of Montmollin's argument. At the level of abstraction at which he is dealing,

* "The new forms of work organisation, as with the old, cannot accomodate the existence of contradictions, struggle and conflict .....There is only misunderstanding, not opposition."
(My translation).

** "All conflict, all contradiction is the result of ignorance, of not thinking clearly, or of the inexcusable blindness of those swayed by emotion."
(My translation).

I think almost every post-Taylorian managerial strategy, or theory, would emerge as similar to Taylor. All managerial theory accepts the 'vertical' division of labour, seeks order and harmony, and productivity, and is 'rationalistic.' In short then these features are so abstract that they do not distinguish Taylorism and job redesign, because they cannot distinguish any theory of management from any other. Montmollin's conclusion, that,

> "A.l' exception, importante, des recherches sur les groupes semi autonomes, l' anti-taylorisme est un neo-taylorisme" (With the important exception of research on semi autonomous groups, anti-taylorism is in fact a neo-taylorism.")

reflects far more on his method of analysis than on the content of its subject matter. The exceptions to this judgement are worthy of notice: both Taylorism and the theories of job redesign are individualistic, and both accept, to a large degree the continued separation of execution and conception, in its major aspects. It is not true however that such theories cannot account for conflict: they all proffer ideas on this point, and although these may well be inadequate, it is unfair on Taylor to place him alongside such views, given the greater sophistication of his own.

A more empirical approach has been adopted by both Chave,[69] and Pignon and Querzola.[70] Chave examined four cases of job redesign and related developments in each to his conception of Taylorism. This he took to consist of five principles: control of labour, knowledge, time, language, and individualisation of work roles. The four cases of job redesign affected these dimensions very differently leading Chave to conclude that it was difficult

to say whether job redesign as a whole was, or was not, 'neo-Taylorist.' The same criticism can be made of this work which was directed at that of Montmollin, namely that it conceptualised Taylorism at such an abstract level that it is difficult to distinguish it from any other general philosophy, or system, of management. Furthermore, by focussing mainly on the dimension of control, it tended to omit some of Taylor's more specific contributions, such as his development of time and motion study.

The work of Pignon and Querzola consisted of a re-interpretation of two case studies, those of A.T. & T, and Donnelly Mirrors. The principal point of interest in this work was the authors' stress on the importance of examining changing forms of control. Thus, in the A.T. & T. case they noted (see also above) that whilst direct supervisory control was eliminated for a number of workers, this did not signify an absolute reduction in control, because the workers were allowed to consult directly with their clients, so that customer complaints came to function as a new control mechanism.

The most recent work on this subject comes from Coriat, who has produced an extremely comprehensive essay.[71] The focus of the essay was the assembly line and the changes that have been introduced into its organisation by a number of French manufacturers. After tracing the origins of the assembly line to the initiative of Henry Ford, and to the necessity to increase economic efficiency, as well as control

over labour, Coriat then posed the question as to why manufacturers have been able, in recent times, to shorten or even abolish assembly lines. Classically, such measures would have been expected to reduce efficiency and increase labour costs, but they appear to have had the opposite results. Coriat's answer was similar to the one that will be presented in this thesis: the assembly line is an efficient form of work organisation, given adequate materials supply, continuous work flow, and near equal work station times. Where these conditions cannot be met sufficiently, waiting time and balance-delay time results. Reducing or abolishing the assembly line eliminates or reduces this non-productive time and thus raises efficiency. And on the issue of control over labour, Coriat notes that empirically, the relaxation of control through paced, inter-dependent work is often complemented by an increase in centralised control and/or by the setting of work standards. This form of job redesign can thus be seen as a form of Taylorism.

Since a similar argument will be developed later in the thesis (though based on a much fuller understanding of Taylorism), I shall simply note here one of the limitations of Coriat's work, which is its concentration on the assembly line. Other forms of work, and of job redesign were not examined, and this omission is significant because it will be argued later that different forms of job redesign, in different types of work organisation have differing relationships with Taylorism, a conclusion that may be avoided or

overlooked by focussing on only one type of work organisation such as the assembly line.

Overall then, French industrial sociologists have offered a number of very pertinent, and useful insights into the specific relationship between Taylorism and job redesign. These include the notion that both can be seen as concerned with mechanisms of control over labour, and that both are concerned with the efficient use of time in flowlines. Methodologically, the French work, despite several limitations and misconceptions, referred to above, has shown the potential value of using Taylorism as an analytic tool in the appraisal of job redesign.

Towards a theory of job redesign

This section will attempt to develop a general theory of job redesign, a task that will proceed in a number of stages. The subject matter of the theory will be as indicated in the four propositions outlined in the Introduction to the thesis, covering the origins, mechanisms, and consequences of job redesign. In the penultimate chapter a number of additional issues will be indicated to which any general theory ought also to address itself. The limitations of space, as well as of the data available, will not permit them to be examined in detail here. This section will begin with a brief discussion of some recent, and pertinent, work in industrial sociology. The four ensuing

parts of this section will then take up the propositions discussed in the Introduction.

At a very general level job redesign theories were said to have posed a challenge to theories and perspectives which heavily emphasised the role and the significance of financial rewards in work motivation. Theoretically, Baldamus has argued that industrial administration hinges on the control of effort and wages, and that the wage-effort bargain lies at the heart of employer-worker relations.[72] In this perspective, workers are seen as attempting to maximise their rewards (wages) relative to their costs (effort). Employee job performance is seen not as a reward but a cost, a view at variance with much job redesign theory. This view has been restated by Westergaard more recently,[73] and has also been supported empirically by the work of Goldthorpe et al. which showed the pervasiveness of an 'instrumental orientation' to work, although there are a number of problems with this evidence.[74]

Research into the consequences of payments systems, such as the classic studies by Roy,[75] and the more recent work by Klein,[76] again serves to reinforce the contention of Baldamus that, at least under certain conditions, many workers strive to increase their wage-effort ratio. Correspondingly, the two major, recent reviews of the efficacy of pay incentives for raising performance, concluded that under certain conditions, they could indeed have this effect.[77] And it has recently been argued by Ackroyd that

studies such as Gouldner's 'Wildcat Strike,'[78] classically taken to have shown the limitations of an economic model of behaviour, can in fact be interpreted quite adequately and plausibly in economic terms.[79] A similar argument was, of course, advanced by Carey,[80] and by Sykes,[81] with regard to the 'Hawthorne Studies.'

There is then a current of literature (reviewed here very selectively) which suggests that economically based models of industrial behaviour are of continuing relevance, and that studies critical of this type of model can themselves be interpreted within it. This general perspective will inform the theory of job redesign now to be elaborated. In the Introduction to the thesis, four issues were isolated for examination, namely the relation between job redesign and scientific management, and the practical origins of redesign; intrinsic motivation - or the mechanism of redesign; the relation between job performance and job attitudes; and the consequences of redesign with regard to worker and employer interests. Let us now turn to the first issue.

Job redesign, scientific management and division of labour

In discussing the 'origins' of job redesign in Chapter 1, I wrote in a theoretical and historical sense of its relationship with scientific management and this was summarised in Chapter 4. Yet there is a second sense

in which one can use the notion of origins, and that is to denote the specific problems or issues which gave rise to the implementation of job redesign within a particular plant or company. Such problems or issues may include absenteeism, production scheduling, or industrial conflict, to give just a few instances, and it is this second usage of origins on which we shall now concentrate.

There is a conventional, potted history of job redesign which runs roughly as follows: enhanced division of labour initially brought many benefits, such as increased productivity, but as jobs became smaller in scope, and as educational levels, and standards, and workers' aspirations rose, then a number of 'dysfunctional' consequences were increasingly manifest. Absenteeism, turnover, poor performance, and even disputes were taken as the behavioural responses to impoverished jobs, and thought to be associated with low morale. The remedy for these problems followed clearly from the diagnosis: jobs had to be redesigned to allow the enjoyment of variety and 'wholeness,' and the exercise of autonomy and responsibility.

This view does have an element of truth as shown most strikingly in published reports from the Volvo company in Sweden where it seems high labour turnover and recruitment problems played a key role in decisions to embark on work reorganisation.[82]

Nevertheless, partial truth must not be taken for the whole truth, and problems of morale and personnel

have by no means inspired all, or even a majority of job redesign cases, a fact that emerges from the available evidence on this question. In the Work Research Unit Report of 111 cases of 'work restructuring' (some of which are nothing to do with work restructuring, and which have been excluded) absenteeism, turnover, morale and motivation problems were given as reasons for change 46 times, in 39 cases (178 reasons for change were given altogether).[83] The Birchall & Wild report provided data on the motivations behind 31 cases, 35 reasons being given in all.[84] Only 14 of them (40% of reasons, 26% of cases) referred to absenteeism, turnover, low morale, or poor social relations. The 'Work in America' report gave 48 reasons for 29 cases, nineteen of which (40% of all reasons and 42% of cases) referred to absenteeism, turnover or morale.[85] Schoderbek, in 1969 used a postal questionnaire, to elicit reasons for innovation from firms that had used job 'enlargement,' and found that of the 86 reasons given, by 41 firms, only 30 (35%) referred to a desire to enrich jobs or ameliorate personnel problems such as low morale.[86] These, and other findings have recently been summarised by Wild & Birchall, who showed that the prevalence of personnel problems as a factor in job redesign exercises was between 26% and 42% of all reasons given.[87] Much more common among the list of problems were productivity, product quality, and costs, between 13% and 56% of all reasons given, in different studies.

There are, however, a number of problems with this type of data which must be raised before it can be properly evaluated. Firstly, the postal surveys of companies, e.g. by Schoderbek, have typically elicited rather low response rates, in the order of 40-55%, and it is therefore difficult to know how representative the samples are. Secondly, and more seriously, even if the samples were representative, there may exist different motivations and reasons for change among different sections of management, and it thus becomes important to know which managerial specialist completed the survey in each case. Indeed one of the case studies in Chapter 9 will examine this question in some depth, and illustrate the existence of multiple motives in job redesign.

Of course these are not the only reasons underlying job redesign innovations: manufacturers of domestic appliances have been adversely affected by competition, and have found the inflexibilities of the assembly line very costly when switching product runs. 'Individual' assembly can avoid some of these problems by permitting the production of a variety of products simultaneously.[88] Again, other companies have been moved to action by the need to reduce costs, to which end, work has been pushed further down the hierarchy to cheaper labour, and the more expensive workers eliminated.

Discussions of the assembly line, of specialisation, and their problems are by no means a recent phenomena,

reflecting awareness of 'blue collar blues,'[89] but have a much more longer economic background going back to the 1950s.

Progressive assembly lines are designed around a series of work stations, and in order for the flow of production to be continuous it is necessary that workloads at the stations should be evenly balanced. This is not simply a technical problem for inequalities in work rate also reflect differences in ability, motivation, and training, but nevertheless, from 1955 onwards, it was the technical aspects of inefficiency which received the most attention. Salveson's paper, in 1955, is generally acknowledged as the first major statement, and attempted solution of the 'assembly-line balancing problem' and it will be recalled that it was also at this time that the first experiments in job 'enlargement' were conducted.[90] Since 1955 a series of reports on this problem have appeared, and it has been categorised into three areas:[91] the first is the balancing, or balance-delay problem which arises owing to the difficulty of equalising cycle times for all workers on a line so that unoccupied time is at a minimum. The problem of course is complicated by differences between employees (indicated above), and by fluctuations in rate of working. Secondly, there is non-productive time, consumed in handling materials and products, in order to pass them down the line. And thirdly, there is waiting time due to interruptions in supplies, machine

breakdown etc., a problem magnified in its effect by the work role interdependencies on which the assembly line is constructed. Although this debate has now ventured into complex mathematical solutions, early results and discussions did suggest that balance delay and non-productive time declined, relative to productive work time, as work cycle length increased. There was, in other words, an economic argument, internal to assembly line structure and functioning (i.e. leaving aside 'personnel' considerations) for increased cycle times.

More generally, specialisation of labour in other spheres can and has been taken too far, a fact recognised not only by job redesign theorists, but by work study specialists as well. Currie, for instance, author of a standard text on the subject has written that, unoccupied time in the working day,

> "From the point of view of management, however,.... is wholly undesirable, representing as it does an imbalance in the use of labour or labour/machine resources. Since production plans should normally be based on the best possible use of labour, every opportunity should therefore be taken to reduce U T to a minimum." 92

And there follow various recommendations as to how this may be achieved, including, for instance,

> "Workers do other work during the machine controlled part of the cycle ..... such as cleaning." 93

And this example has been put to use in several cases of job redesign as we shall see. Equally, Barnes, author of another standard text on time and motion study, acknowledged that although,

> ".....there are many situations today in which labour effectiveness can be increased and unit and total costs reduced by division of labour." 94

nevertheless, a reversal of division of labour may be equally effective under certain (unspecified) conditions.

The separation between academic disciplines, of work study, industrial and production engineering etc., and industrial social science has allowed these discussions of economic problems of specialisation and job redesign to be conducted in almost complete isolation from each other, although there are a few exceptions.[95] It is also worth pointing out, in this respect, that the first (and many of the subsequent) report(s) on work restructuring at Philips, by van Beek, began with a detailed analysis of the kinds of problems afflicting the assembly-line, that was very similar to the discussion presented above. It did, not, then, begin with personnel problems, although absenteeism reduction was seen to be an outcome of assembly line reorganisation.

We find then that debates in the psychological sphere on 'blue collar blues,' and fragmentation of jobs, have their parallel in the 'economic sphere.' Reorganisation of assembly lines can also be seen to have emerged in response to problems of assembly-line balancing, and other inefficiencies, whilst reorganisation of other types of work may be seen as

an attempt to minimise unoccupied time. And it will be recalled that the sociotechnical studies reviewed in Chapter 4 were interpreted as efforts to remove obstacles to efficient utilisation of labour under certain technological conditions.

Such changes in work organisation appear to be 'radical' to job redesign theorists because of their almost exclusive focus on division of labour as the turning point of their activity, but when one puts enhanced division in its proper perspective, and sees it simply as a method (albeit a very powerful one) for raising productivity, reducing costs etc., then a different picture emerges. We saw earlier that enhanced division of labour was not an integral feature of Taylorism, and that within Taylorism as a whole it was subordinated to objectives such as those mentioned above. Under different conditions, reversal of division of labour might be equally necessary for their achievement. Productivity increase, cost reduction, and quality improvement are precisely the sorts of objectives that have been shown by surveys of companies to be salient in the use of job redesign. And these problems, as we have seen, have also been reflected in the literature.

None of this is to say that job redesign is insignificant when viewed against a background of constant objectives (but more will be said on this theme in later sections), or that the debates on job attitudes and morale, blue collar blues etc., are merely epiphenomenal reflections of 'basic

economic' trends and issues. Such a view would, of itself, be too crude. But it would be equally unwarranted to argue that the psychological level of 'reality' had determined the economic, or again to say that the two levels of debate and activity were independent.

This latter view would seem to be discredited by virtue of their contiguity in time, and by their intermingling in some of the job redesign literature. It has already been observed that economic problems of production appeared to predominate amongst reasons given for embarking on schemes of job redesign, although the evidence here should be treated with caution. One could also argue, more generally, that, at least in the manufacturing sector, economic concerns such as efficiency, profitability, costs, etc., are of prime concern for employers and that employee attitudes and morale must be placed in the context of adequate economic performance. It seems plausible to argue therefore that whilst there may have been reciprocal influence between the economic and psychological levels and concerns, the greater influence would have been exerted by the former on the latter rather than vice versa. The implications of this argument for the historical significance of job redesign will be treated in the penultimate chapter, but further implications will be drawn in the next section, on the mechanisms of job redesign.

Intrinsic motivation

In the analysis of the major sociotechnical case studies

(Chap. 4), job redesign was characterised, at a general level, as a form of intensification of labour. In other words, workloads and/or work rates are increased. The term 'intensification' does not indicate the mechanisms responsible for whatever benefits emerge except insofar as they arise from the more efficient use of labour, rather than the introduction of new machinery, the adoption of improved work methods, or the use of additional labour or man-hours. Two mechanisms were indicated in the analysis of the socio-technical studies: one was the displacement of labour and the consequent raising of workloads, whilst the other was the use of pay rises and incentives. Both mechanisms were prominent features of the theory and practice of scientific management (see Chap. 2), and their combined operation was shown to offer a more plausible and adequate account of the studies in Chapter 4. Insofar as labour displacement entails, ceteris paribus, higher effort levels for those employees remaining on a particular job(s), these two mechanisms, of displacement, and pay rises and incentives reflect the twin poles of the wage-effort nexus, referred to earlier.

As we shall see however these two mechanisms in themselves, will not provide a general account of job redesign outcomes such as productivity and quality improvements. They will not account for quality improvements (unless quality bonuses are provided), and nor can they accomodate those cases in which no payment or manning changes have occurred. To cope with these issues, two further mechanisms

are proposed, and a limitation is placed on the applicability of the theory. It should also be noted that, at this stage, we are concerned with explaining only economic outcomes, and not changes in attitudes, absenteeism, or turnover - these will be referred to in the next section.

The two further mechanisms are firstly, that of increased accountability for performance, i.e. an enhancement of one form of control over labour; and secondly, stemming from the discussion of assembly-line inefficiencies in the previous section, the mechanism of work methods improvements, i.e. reduced waiting time, unproductive time etc. Again, both of these mechanisms have their theoretical origins in scientific management. Increased accountability has been alluded to in a number of case studies, such as those reported by Guest [96] but has not been conceived of, except by Fein, and by Parke & Tausky, as playing a major role in the genesis of the observed economic outcomes. Yet, as we shall see, mechanisms of accountability have been established in many cases of job redesign.

The mechanism labelled work methods improvements derives from the discussion of assembly-line inefficiencies, and although referred to in one or two case studies, it has generally been neglected by theorists in this area. We shall see however that it is of considerable significance.

The limitation on the scope of this theory derives from earlier discussions of individual differences in job attitudes

and orientations to work, which suggested that sections of the labour force may hold, in some contexts, an "intrinsic" orientation to work and may experience greater motivation and satisfaction after job redesign (Chap. 3). Equally, there are, as we shall see, cases where none of the four mechanisms postulated above can be shown to have been operative. How then are we to account for performance improvements here? The individual difference literature can provide one possible solution. This literature has sometimes been used to suggest that segments of the labour force, varying in size from 20% to 80%, would not be responsive to job redesign. But it was shown that this notion was inadequate as people use different evaluative frameworks at different times, or even for different jobs.[97]

I would now like to suggest a further amendment to this literature. Different sectors of the labour force may all respond, more or less positively to job redesign, but for different reasons, as some writers have suggested. For workers in the majority of cases, it will be argued, the attractions of job redesign may lie in its implications for the wage-effort bargain. Other workers however may respond to job redesign in the manner posited by job redesign theory, i.e. they may raise their performance on an 'improved' job, and derive satisfaction from this performance, regardless of changes (or their absence) in extrinsic rewards and controls.

But instead of simply seeing these interests as differing requirements of work, I would go further and suggest that they also indicate, and are associated with, different mechanisms of improved performance. A single-mechanism theory, based on intrinsic motivation, is inadequate here, but what is being argued is not that the 'classical' theories of job redesign are inadequate per se and need replacing, but rather that they are adequate only for a small minority of the working population. For the majority one requires a theory of the form that has been sketched out above.

This theory of different mechanisms for different sectors of the workforce is not, of course, very parsimonious. But we saw, in Chapter 4, that in trying to account for certain attitudes and behaviours in the sociotechnical case studies, writers such as Rice had to resort to ad hoc additions to their theory of intrinsic motivation. The substitution, in that context, of a theory centred on the wage-effort bargain, and labour displacement, was dictated, in part, by the demands of parsimony. Yet paradoxically the general theory of job redesign offered here has emerged as less parsimonious than those currently in existence.

This general theory does however have a number of advantages over its rivals: firstly, it incorporates the literature on individual psychological differences into a general theory of job redesign by relating these differences to the actual mechanisms of redesign itself. Such differences are no longer seen simply as moderators of the job content -

job attitudes and behaviour link, as in task design theory. Secondly, this general theory also succeeds in tying a phenomenon largely studied by industrial psychologists to some of the, very different, findings and concepts of industrial sociologists reviewed above. This latter work, with its emphasis on extrinsic orientations, and the cash nexus, has seemed strange in comparison with the stress laid by job redesign theorists on the growth of demands for more challenging and interesting work, and the possibilities of raising performance without the 'carrot and stick.'

Thirdly, the emphasis on pay as a motivator and the acknowledgement of the role of intrinsic motivation constitutes a more adequate accomodation of these mechanisms than is to be found either in Herzberg or sociotechnical systems theory where pay incentives were acknowledged but not properly integrated into the respective theories.

And finally, the theory can, in principle (as we shall see) account for both individual and group job redesign, in contrast with the classical theories which tended to focus on one or the other.

It might of course, be objected, that evidence on the efficacy of financial incentives is far from unequivocal, especially if one examines some of the more rigorous psychological, laboratory studies.[98] Even though many of these studies have suggested pay rises and incentives can improve performance, where pay is contingent upon performance, their theoretical significance must be questioned, for a

number of reasons. Firstly, they have often employed university students, who have had, on average, fewer dependants and domestic commitments as compared with the working population, and whose attitudes to financial rewards may have been correspondingly different. Secondly, the 'tasks' in these studies have typically been of short duration - measured in hours or days, rather than years - so there may have been little scope for the development of social attitudes and norms surrounding pay. But thirdly, and most seriously, such studies have invariably (though not always) failed to simulate the employment relationship itself, in which a worker sells his capacities for work in return for a wage, with all that can imply in terms of attitudes to performance and rewards. For these reasons, such studies cannot be assumed to have generalisable implications for 'real life' situations, and they have not therefore been reviewed in detail.

However two major reviews which have combined both laboratory and field studies have suggested that under certain conditions increases in financial rewards, either directly or through incentives, can raise performance.[99] Equally, Lindholm studied the effects of changes in payment <u>systems</u> across a range of companies over a period of years, in Sweden.[100] Although his findings are subject to the usual qualification in this area that one often doesn't know about simultaneous changes in plant organisation, supervision, work methods etc. which might be equally significant in performance changes, they are nevertheless suggestive.

The total sample of plants was 73, and of those which replaced piecework with flat-rates, i.e. abolished incentives, productivity fell on average by 15-25%. Those however which reduced the incentive component of earnings by moving from piecework to flat rates plus incentives experienced productivity increases of 5-10%. Those companies which introduced an incentive where none had previously existed, i.e. moved from flat rates to flat rates plus incentives, experienced productivity increases averaging 25-35%. In other words, the most dramatic effects were produced by the introduction or abolition of incentives, although there would appear to be a supplementary negative effect on productivity associated with piecework.

These findings, as well as the conclusions of the Lawler and Marriott reviews reinforce those obtained from case studies which have documented both the incentive and disincentive (output 'restriction') effects of incentive or piecework pay systems.[101] What all of this literature has not indicated so clearly are the contingencies affecting the operation of pay incentives, or the precise mechanisms involved in pay incentives. It is possible for instance that incentives act indirectly on performance via work methods, or improved supervision, as Marriott has suggested. In this thesis we shall principally be concerned with the effects of pay rises and incentives on productivity, rather than with the two latter points, on contingencies and mechanisms.

But do the above arguments mean that the notions of job autonomy, responsibility, variety etc. are of no concern to workers and are simply not required in a theory of job redesign? No, it does not. What I have sought to offer so far is a general theory of economic improvements in cases of job redesign, i.e. changes in productivity, quality, costs etc. When we turn to examine job attitudes in the next section, I will suggest that changes in job content are of some importance.

Job attitudes and job performance

One of the central propositions of all theories of job redesign is that improvement in job content in certain specified ways will enhance both employee performance (via motivation) and job satisfaction. Although it is not always clear whether satisfaction derives from performance or vice versa, it is clear that job performance and job satisfaction (more broadly, job attitudes) are both expected to improve. This being so, there arises the problem of how to explain those cases where job performance has changed, but attitudes, or satisfaction have not,[102] and those where attitudes, or satisfaction have improved, but performance has stayed constant.[103] Job redesign theorists have tended to adopt a rather ad hoc approach to this kind of problem. Locke et al. for instance invoked special reasons for such deviant findings: performance and attitudes improved

initially, performance partly because of 'technical' factors, such as better organisation of work, but when expected pay increases failed to materialise, disappointment set in. Frank & Hackman, on the other hand, confronted with no improvement in job satisfaction as a result of their changes, explain this by reference to unchanged job perceptions, but their report indicates that simple intensification of labour did take place,[104] (stock classification, checking and verification work was transferred to 'experimental' employees) and that presumably, therefore, productivity did increase.

But, more generally, what sorts of explanation are possible for these attitude-behaviour discrepancies? First of all employees may have little opportunity to improve performance, perhaps because of technological constraints, despite improvements in attitude. This however does not apply to any of the cases referred to in the foot notes. Secondly, employees' attitude change may only be reflected in improved quality rather than output, as suggested by Lawler, since performing more work may not yield the psychological rewards to be gained by performing better quality work. Lawler suggests this 'model' does accord with the facts, and a review of ten job 'enlargement' cases showed increases in product quality in all of them, but increases in productivity in only four cases. In fact, had Lawler read his cases more carefully, he would have seen that productivity increased in all of the cases, with one exception, that being a study of supervisors, whose productivity is in any case difficult to

measure accurately.[105] Thirdly, it may be suggested that some improvements in job performance undoubtedly derive from the myriad of 'technical' improvements associated with some of these schemes, a suggestion made recently by Locke et al.,[106] Tausky & Parke,[107] and Susman.[108] The problem with this view is that unless the general efficacy of such 'technical' improvements is clearly specified, then explanations of this sort will tend to remain at the level of post hoc accounts of awkward results. Fourthly, we must consider the utility of expectancy theory, a view argued for by a variety of authors, such as Wilson,[109] Guest & Fatchett,[110] Lawler,[111] and Tausky & Parke.[112] According to this view, employees have different preferences, different notions about effort-performance, and performance-reward links, and different abilities and perceptions of their roles. Some may be uninterested in job redesign, but respond to increased pay or control, and vice versa. How then can this theory explain attitude-behaviour discrepancies? Improved attitudes without changed behaviours and productivity rises, at one level, present no problem: employees behave in a way that satisfies their needs, regardless of whatever their employers may think. And improved performance without improved attitudes follows from the idea that attitude change, e.g. increased satisfaction, is dependent (though not necessarily so) on rewarded performance.

This theory, it must be said, is quite persuasive, and plausible, but it does encounter, for our present purposes,

two difficulties. First of all, as is known, it is a process, rather than a content theory of motivation. What this means in terms of explanation of job redesign outcomes is that any such explanations must be wholly circular. For instance, the absence of improved performance in the Christiania Spigerverk study could be 'explained' by saying that workers did not value the rewards that would be thus obtained (although it's far more likely they were apprehensive about the costs entailed). And how do we know they didn't value such rewards? Because their behaviour remained unchanged. What is required therefore is an independent specification of valued rewards, of the content of motivation, an exercise which implicitly points up the limitations of expectancy theory. Secondly, expectancy theory would have difficulty accounting for a case of improved productivity through more efficient methods where there also occurred an increase in job satisfaction. For according to expectancy theory, satisfaction is contingent upon performance, which in turn is a function of effort, and yet here we have a type of case where there is no increase in effort, but there is nevertheless an improvement in attitudes. Any general theory of job redesign must be able to account for such cases.

The final possible explanation for attitude-performance discrepancies lies in the realm of measurement. It has been noted by a number of writers that the terms satisfaction and performance have been conceptualised and measured in very different ways. Some studies have used objective performance measures, whilst others have used ratings. Again there exist

different concepts of satisfaction - should it be seen as an absolute phenomenon, or as a function of the difference between expectations and perceived 'reality.'?[113] If expectations are considered important, then it is possible that the same absolute score on a simple satisfaction scale such as the JDI or the WOS,[114] may indicate different levels of satisfaction because of simultaneous changes in perceived reality and expectations.

Whilst it is undoubtedly true that existing measures of satisfaction, of job attitudes more broadly, and of performance, are likely to contain deficiencies, it is worth pointing out that this type of argument has been in circulation for a considerable period of time and that more recent studies show no signs of higher correlations than earlier studies using (presumably) less rigorous measuring instruments.[115] It seems unlikely therefore that attitude-performance discrepancies can be laid wholly at the door of measurement, and as Vroom suggests, what is required is fresh conceptualisation.

Before embarking on this task it is worth briefly indicating the kinds of attitude-performance relationships that have been found in the general literature of industrial psychology, outside of the specific job redesign area. The earliest review was that of Brayfield & Crockett, in 1955. On the relationships prevailing for individuals, they reported that only two out of fifteen correlations reached statistical significance, and an equally bleak picture held

for group analyses.[116] In 1964 Vroom undertook a similar review, and concluded that the median satisfaction-performance relationship across 20 studies spanning the period 1945-63 was r = 0.14 (statistically non-significant). The correlation rose slightly to r = 0.22 if studies which failed to use objective performance data were excluded, but even this result did not reach significance.[117] Vroom's conclusion has been widely reported, and accepted, and can be found in standard textbooks of industrial psychology, such as Blum & Naylor,[118] and Tiffin & McCormick.[119]

It is nevertheless the case, that many studies have shown positive (albeit small) correlations between satisfaction and performance, and whilst one can legitimately reject the notion of a general relationship, there may be circumstances under which the phenomena do correlate, as studies of job redesign have shown (see the ensuing chapters).

The cases of attitude behaviour discrepancy need not, and should not, be treated as deviant departures from the norm of congruence. And so long as they are treated as deviant they will continue to generate a variety of ad hoc amendments to the basic theory of job content - motivation - performance - satisfaction. The real problem, I would suggest, is that the basic theory is inadequate, and on the basis of the so-called deviant cases a more plausible alternative can be proposed. The alternative is a dualistic mechanism theory, whose basic postulate is that job satisfaction and job performance are generated by different mechanisms.[120] Job satisfaction may result from job redesign

that is, from increased autonomy, variety, responsibility etc. But improved job performance is a function of one or more of the following mechanisms: pay rises, pay incentives, managerial control, neogotiated higher workloads and/or performance standards, and more efficient methods and organisation of work, except that is for 'intrinsically motivated' workers. Normally, the two sets of mechanisms operate simultaneously, thus giving rise to the idea that there is a logical, or a necessary connection, between satisfaction, and performance. But in the 'deviant' cases what we see is not so much the operation of abnormal factors, but the normal operation of only one of the mechanisms described above, independently of the other. Their independent operation, usually concealed by simultaneity, is revealed in the deviant case.

This theory of twin mechanisms has at least three advantages over its orthodox rivals; firstly, it can explain more plausibly, the deviant cases of attitude - behaviour discrepancy, by postulating separate mechanisms for each; secondly, it accords with the vast literature on correlational studies of job satisfaction and job performance which have shown an exceedingly low correlation between the two, even for employees performing "motivating jobs" (in terms of job content);[121] and thirdly, it accords with the fact, shown by Conant & Kilbridge, Daniel, Goldthorpe, and others, that workers have contradictory attitudes towards work, being oriented both towards pay, security etc., on the one hand and expressing preferences for variety, autonomy

etc. on the other.[122] The orientation towards pay ensures its continued efficacy as a means for raising productivity, whilst the simultaneous liking for variety etc. makes it likely there will be a favourable response to job changes along these dimensions.

It is worth pointing out that a similar notion of twin mechanisms governing behaviour and attitudes has been advanced in the field of absenteeism by Nicholson.[123]

The distinction between job performance and job attitudes parallels that between motivation and satisfaction, although the two are not synonymous. We saw earlier that one of the problems with Herzberg's theory, in particular, was its failure to distinguish these concepts analytically and empirically. What has been suggested above, and with reference to case studies, is that employees can be "motivated" to perform at higher levels but that this does not necessarily mean they will show higher levels of job satisfaction. Indeed behaviour and satisfaction levels can change quite independently. Job satisfaction has been shown to be related (albeit to small degrees) with a wide range of features of the work situation, but the suggestion made above is that job performance is under the control of a much narrower range of features.

The principal difficulty with this idea of dual-mechanisms is the lack of specification of their content. The previous section has hypothesised mechanisms governing job performance, but what are the factors governing job satisfaction and job attitudes? If we turn to the literature

for suggestions or guidance, we find little of value. Empirical studies of job satisfaction have demonstrated a remarkably wide range of variables affecting it, and Vroom argued in his 1964 review that job satisfaction appeared to be correlated with high pay, good promotion opportunities, considerative and participative supervision, opportunities for social interaction, task variety and task autonomy.[124]

Herzberg has attempted, to distinguish motivating and hygiene factors in the work situation, but there are problems with his specific theory, as we saw in Chapter 3. More recently, a number of writers have abandoned content theories of attitudes and performance, and sought to develop process models, e.g. expectancy theory (see above). Whilst this is an understandable and useful development, it doesn't help in the construction of a content-theory of attitude determinants. All that can be said therefore is that the range of factors determining attitudes is greater than the range determining performance; that the performance determinants are those cited in the previous section; and that determinants of attitudes may be located in a variety of organisational and individual features. Because of these dual mechanisms, we would therefore predict attitude-behaviour discrepancies. It still remains for us (or others) to specify the conditions under which attitudes and behaviours do or do not correlate.

To some degree these discussions of motivation and satisfaction have remained at a rather abstract level, but for the moment (and indeed for the next few chapters), these rather crude formulations will suffice for our analytical purposes. In Chapter 11, some of the conceptual problems hitherto avoided will be looked at in more depth.

The mutual interests of workers and employers

Another distinguishing feature of all theories of job redesign is the proposition that one and the same set of changes in job content will simultaneously benefit both workers and employers.[125] Workers will derive more satisfaction from the performance of more varied, responsible, and autonomous jobs, whilst employers will derive the benefits of increased output, and/or productivity, quality etc. In this way job redesign caters for the mutual interests of workers and employers (see Chaps. 3-4). Methodologically, it has already been suggested that the validity of this proposition cannot be assessed until we have also considered whether job redesign brings any costs for any of the parties involved.[126] The answer given to this question, on the basis of an analysis of the sociotechnical case studies, was that job redesign does entail costs for workers, under certain conditions. And at a general level it follows from the characterisation of job redesign as intensification of labour that there is, first of all, an increased expenditure

of effort per unit time. Insofar as effort can be seen as a cost of employment, for the worker, to be set against wages, we can suggest that this is a cost inherent in job redesign. But effort and wages are related, conceptually, and it may be that increased effort receives increased pay with no net effect on the wage-effort level. We also saw, under certain conditions, particularly where output was technologically - determined to a high degree, that successful job redesign was associated with a loss of jobs (Chap. 4).

In other words, we can suggest that job redesign entails, generally speaking (and more will be said of the exceptions in later chapters) an increased expenditure of effort, and that this may be associated with loss of jobs. If this proves to be the case, then we must re-evaluate the claim of job redesign theories to be of mutual benefit to both employers and workers.

Summary of the theory

The theory of job redesign advanced in this chapter may be summarised in the following postulates:

1. It may be seen, at a general level, as a form of intensification of labour.
2. Job redesign, a process entailing reversal of division of labour, emerged at least in part as a response to inefficiencies in production processes.
3. Because of its general character and the mechanisms employed, job redesign cannot be said to have 'abandoned' scientific management.
4. The mechanisms of job redesign, for the majority (extrinsically-oriented) of the work force, were postulated as: pay rises and incentives; displacement of labour and setting of new performance standards; enhanced accountability and control; use of work and methods study. For intrinsically oriented employees it was argued that the propositions of current job redesign theories were adequate.
5. It was suggested that the above mechanisms principally affected employee job performance, but that job attitudes and satisfaction were a function of a wider range of variables, including the new job content. Hence, performance and attitudes could change independently. This distinction between concepts parallels the distinction between motivation (to perform) and satisfaction.

6. Job redesign entails the cost, for workers, of increased effort expenditure (which may be counterbalanced by higher wages) and may also result in loss of jobs. Hence it may be inaccurate to say it caters for the mutual interests of workers and employers.

The first postulate indicates the general character of the phenomenon of job redesign; the second and third postulates denote the origins of job redesign, empirically and theoretically; the fourth and fifth postulates identify the mechanisms of job redesign, and the relationship between job attitudes and performance; and the sixth postulate refers to the consequences of job redesign. These postulates therefore map directly onto the four central propositions of classical job redesign theory outlined in Chapter 1, covering its origins, mechanisms, and consequences. The 'core' postulate is number (4) - on the mechanisms of job redesign, because from this postulate follow three others. If the mechanisms are as described, then under certain conditions, employees will suffer consequences such as job losses and increased effort expenditure (postulate (6)). For the same reason, it follows that job redesign cannot be said unequivocally to have abandoned Taylorism (postulate (3)), and it follows that it may be seen as intensification of labour (postulate (1)). The remaining postulates are, relatively speaking, more independent.

NOTES AND REFERENCES

1. Baldamus, W. 1961, described by Wilson, N.AB., 1973.

2. White, B.J. 1977. Delamotte, Y. 1976.

3. Braverman, H. 1974.

4. Zimbalist, A., 1975. cf. also Winpisinger, W. 1973 who argues this is true only for some companies; Nichols, T. 1975, who argues empirically, from one case study, that job 'enrichment' involves fairly minor changes. In fact many cases of job redesign, empirically have involved far more than the rather minor innovations reported by Nichols. Finally, Levitan, S & Johnston, 1975 remark, correctly, that a certain faddishness is evident in a number of job redesign applications, but fail to indicate clearly what is essential to job redesign, from which this 'faddishness' can be distinguished.

5. Nichols, T. & Beynon, H. 1977, p. 16.

6. Dickson, D. 1974, p. 182. See also de Kadt, M. 1978 for a similar argument.

7. Banks, T. 1974.

8. Braverman, op. cit.

9. Cooley, M. 1977

10. Barbash, J. 1977

11. Elliott, D. 1976.

12. Hales, M. 1974A; see also Wood & Kelly, 1978.

13. Hughes, J. & Gregory, D. 1973.

14. Trist, E.L. et al., 1963. See also Chapter 4 on 'Responsible Autonomy.'

15. This criticism does not apply to the excellent, if slightly one sided article by Pignon, D. & Querzola, J. 1976 who analyse the A.T. & T. case studies as new forms of control, rather than the abandonment of control.

> "The employees are no longer confronted with the boss as the person they are responsible to but rather with their customers and with the market.

> This labour reorganisation can be formally analysed as a 'democratisation' that leaves the domination of capital over labour to be exercised through the mediation of the capitalist commodity market." (p. 75).

This is an adequate explanation for product quality improvements, but (a) it seems more difficult to explain productivity increases with this model, and (b) many cases of job redesign involve no such 'reinsertion of the job into the process of commodity exchange.' cf. also Brighton Labour Process Group, 1977.

16. Levitan & Johnston, op. cit. S ee also Berg, I. 1976; and Fox, A. 1974, p. 119.

17. Anderson, J.W. 1970 has shown both that job redesign has been applied in services, heavy assembly, light assembly, and process industry, and has also documented some of the variations in form according to technology.

18. Gomberg, W. 1973.

19. Friedmann, G. 1961. Chaps. 6 & 7.

20. Braverman, 1974.

21. Lindholm, R. et al. 1975. See p. 52 ff.

22. Lehman, M. 1969; also Kilbridge, 1961; Wild, 1974.

23. cf. Levitan & Johnston, op. cit. cf. also Gorz, A. 1976B who writes that,

> "... the formula has succeeded insofar as it has been limited to groups of workers with a 'positive attitude' towards work. No combative, unsubmissive, politicised working class has ever been won over by the amelioration - however genuine - of work conditions and climate made possible by job recomposition ....." (p.59).

Notice the false equation here between the absence of 'positive attitudes' and the presence of 'militant' attitudes: no middle ground is allowed in Gorz's black-and-white formulation. It might be more accurate to say that job redesign can succeed except where the workers are militant etc., and that positive or indifferent attitudes are sufficient for its efficacy.

Arguments about the disinterest of workers in job enrichment, on the grounds that they express 'job satisfaction' on questionnaires, have appeared frequently in two of the U.S.A.'s leading labour journals, Monthly Labour Review and the American Federationist. cf. for instance, Brooks, T. 1972; Chapman, W. 1974; Quinn, R.P. & de Mandilovitch, M.S. 1974; Wool, H. 1973; Kaplan, H.R. 1973. Some of these writings have drawn on Dubin, R. 1956, a study whose methodology has been properly criticised by Mann, M. 1973, pp. 26-8. For the converse argument, see Shepard, J.M. 1969, who tries to argue for a causal relationship between these variables on the basis of correlations, and Sheppard, H.L. & Herrick, N.Q. 1972.

24. Zimbalist, 1975.

25. Bosquet, M. 1972. This argument was attacked empirically by Nichols, (op. cit.), and it has also been made recently by Zimbalist, who, with more perceptiveness than Bosquet suggests that job redesign may be either "cosmetic" or potentially subversive of managerial strategy. Unfortunately, Zimbalist offers no clue as to which forms of job redesign, under what conditions, are likely to result in these respective outcomes. A similar over estimation of the significance of job redesign is to be found in Gorz, A. 1976A who suggests that job redesign shows "there is no technical need to turn workers into unskilled robots. Indeed the work process can be so organised that it is simultaneously a process of continuous apprenticeship." (p. 172).

26. See for instance Wall, T.D. & Lischeron, J. 1977, esp. Chaps. 7 and 8.

27. Rasmus, J. 1974.

28. Hales, 1974A. Hales conceptualises this appearance-reality contradiction in terms of a 'false praxis' - workers appear to exercise 'autonomy,' but this autonomy is in fact subordinate to an external, instrumental logic. This notion seems only to tell us that under capitalism, employers' strategies serve their own interests first, rather than those of their workers, an insight that can hardly be considered a revelation. What Hales fails to do is to indicate the ways in which 'false praxis' may be turned to workers' advantage, as at Christiania Spigerverk, or the ways in which it differs from more conventional job redesign. See also Wood, S.J. & Kelly, J.E. 1978 for more on this point. In a slightly later article, 1974B.
Hales has in fact suggested, (a) that the answer to his question is no, because (b) workers can turn such schemes to their advantage.

29. Banks, T. op. cit. Banks article at least has the merit of placing this argument in an interesting perspective, in the form of a rhetorical question, viz. would managements be so keen on job redesign if job satisfaction rose whilst productivity fell?

30. Hughes & Gregory, 1973, cf. also Hughes & Gregory, D. 1978. The main thrust of these papers is, however, to argue against the Herzbergian separation of job content and context, and to reassert the saliency of the latter, given shift working, accident rates, seasonal unemployment, technological change etc. cf. also Hughes, J. & Gregory, D. 1974. The content/context separation has been strongly attacked by Winpisinger, op. cit., who asserts that,

> "If you want to enrich the job, enrich the paycheck."

His view is an extension of Hughes & Gregory which seriously minimises the significance of division of labour.

31. Rosenhead, J. et al. This is one of the clearest expressions of the reality/ appearance contradiction argument, which contains, in fact, no analysis of job redesign per se, apart from the (incorrect) idea that "its a con." A similar problematic was adopted by Wachtel, H. 1974, who states the 'problem' as being 'who gets rich from job enrichment,' answering that management secures productivity increases etc. Having answered his 'question,' he then assumes that it excludes the possibility of workers also benefitting.

32. Blackler & Brown, 1978.

33. The other explanation of this sort currently in vogue, is that since employers would never grant concessions to workers without reason, then (a) either they must be motivated economically, by problems of turnover, absenteeism etc., in which case 'enrichment' for the workers is a secondary consideration, and thus relatively insignificant from the workers' standpoint, or (b) on the same assumption, and accepting that job redesign is not 'trivial' but in some cases substantial, then this can only be because of working class pressure, or militancy. In fact the discovery of productivity increases etc. from job redesign tells us nothing about the possible benefits for the workforce, whilst, on the second theme the number of job redesign schemes initiated in response to worker discontent (narrowly defined) as conflict, etc. is negligible, (see below). And even on a broader definition of 'discontent' using turnover and absenteeism figures, several surveys have suggested these problems lie

behind only a minority of innovations. cf. Butteriss, M. & Murdoch, R.D. 1975, where only 44 of 178 reasons given for undertaking such projects relate to turnover, absenteeism, and morale, and only 15, to industrial relations problems. These figures represent less than 30, out of 111 cases.

On argument (b), above, see Wachtel, op. cit., Rasmus, op. cit., and Friedman , A. 1977A.

34. Another variant of the argument is that whilst managers stress the 'enrichment' effects of their schemes, workers and trade unions respond primarily to the wage-effort features. cf. Roberts, C. & Wedderburn, D. 1974; Daniel, W.W. 1970, has suggested workers have instrumental and intrinsic orientations in different contexts, but his figures have been rightly criticised by Whelan, C.T. 1976. The argument is nevertheless important and will be deployed, in modified form, below.

35. See Chaps. 3 and 4 above.

36. Rasmus, op. cit.

37. A kind of 'indeterminacy' argument has been made by a number of writers: Gorz, 1976C, Friedmann, A. 1977A,B and Fleet, K. 1974 - which consists of the view that the outcomes of job redesign depend on who introduces them, and the extent to which the workers struggle over their introduction.

38. Blackler, F.H.M. & Brown, C.A. 1975, 1976, 1978. Morrow, A. & Thayer, F.C. 1977, have taken this theme one step further by arguing that 'humanistic' and 'materialistic' criteria are empirically incompatible.

39. Tchobanian, R. 1975; Delamotte, Y. & Walker, K. 1973; Kinnersly, P. 1973, pp. 39-41; Elliott, D. 1977; Rasmus, Banks, Roberts & Wedderburn, Elliott, Hales, op. cit; Hull, D. 1978A, B.

40. Elliott, Zimbalist, Rasmus, all op. cit., For Herzberg, F. see 1959, p. 117; Myers, S. 1970, Chaps. 3,5.

41. cf. below, Chap. 6.

42. ibid.

43. All op. cit.

44. e.g. Piore, M.J. 1975.

45. All op. cit.

46. Democracy at Work. 1977, Chap. 3 does try to do this.

47. Gorz, A. 1976A.

48. Friedmann, A. 1977 A,B.

49. Rasmus, op. cit.

50. Wedderburn, D. 1977.

51. Gorz, 1976 A, p. 172 et ff.

52. cf. Kornhauser, A. 1965.

53. Baldamus, W. 1961

54. Smith, P.C. & Lem, C. 1955.

55. Turner, A.N. & Miclette, A.L. 1962.

56. Conant, E.H. & Kilbridge, M.D. 1965. See also above, Chap. 3.

57. For further attitude surveys which seek to 'refute' job redesign, see Imberman, A.A. 1973; Reif, W. & Luthans, F. 1972; Scott, R.D. 1973.

58. Parke, E.L. & Tausky, C. 1975; Tausky, C. & Parke, E.L. 1976.

59. Fein, M. 1974; Fein, M. 1976.

60. Locke, E.A. S irota, D. & Wolfson, A.D. 1976.

61. Parke & Tausky, 1975, p. 13.

62. Tausky & Parke, 1976, p. 561.

63. Gomberg, op. cit.

64. Fein, (1976) p. 485.

65. It is worth pointing out that the ideas on pay and control and their application to job redesign, were in the process of formulation at the time of reading the works of Parke, Tausky & Fein. I did not, therefore, simply take their ideas and build my own work on them.

66. Palloix, C. 1976.

67. Bernoux, P. & Duffier, J. 1974.

68. Montmollin, M. de. 1974.

69. Chave, D. 1976.

70. Pignon, D. & Querzola, J. 1976.

71. Coriat, B. 1977.

72. Baldamus (1961).

73. Westergaard, J. 1970.

74. Goldthorpe, J. et al. 1968.

75. Roy, D. 1952.

76. Klein, L. 1964.

77. Lawler 111, E.E. 1971; Marriott, R.M. 1968. See also Lindholm, R. 1972.

78. Gouldner, 1955.

79. Ackroyd, S. 1974.

80. Carey, A. 1967.

81. Sykes, A.J.M. 1965.

82. See for example, Lindholm, R. & Norstedt, J.P. 1975.

83. Butteriss, M. & Murdoch, R.D. 1975.

84. Birchall, D. & Wild, R. 1973.

85. Work in America. 1972.

86. Schoderbek, P.D. 1968; also Reif et al., 1974.

87. Wild, R. & Birchall, D. 1975.

88. cf. Novara, F. 1973. Also the case study reported below, Chap. 9.

89. cf. Gooding, J. July, 1970.

90. Salveson, M. 1955.

91. cf. Kilbridge, M. 1961; Kilbridge, M. & Webster, L. 1961. Wild, R. 1975; van Beek, H.G. 1964; Wild, R. 1972.

92. Currie, R.M. 1972, pp. 209-10.

93. ibid., p. 211

94. Barnes, R.M. 1968, p. 675.

95. Tuggle, G. Feb. 1969; also Folker, 1973, Scheips, 1972.

96. Guest, R.H. 1957.

97. Conant, E.H. & Kilbridge, M.D. 1965; Cotgrove et al., 1971.

98. For a recent example of this genre see Ter borg, J.R. & Miller, H.E. 1978 and references therein, and for an older, and now outdated review see Opsahl, R.L. & Dunnette, M.D. 1966.

99. See Lawler (1973) and Marriott, 1968.

100. Lindholm (1972).

101. See Klein (1964), Roy, 1952. Also Cunnison, S. 1966; Lupton, 1963.

102. e.g. Kuriloff, A.H. 1963; Locke et al., 1976 and some of the cases in Paul, W. & Robertson, K. 1969; Ford, R.N. 1969, the customer complaints clerks study, experimental group II; Anon.
Experiments to improve the quality of working life in the Netherlands. 1975, Post Office case; Penzer, W. 1973, in which attitudes improved, and then deteriorated whilst output also improved, and then remained constant;
Case in WRU Report 2, op. cit. 'Paper, printing and publishing, No. 5.'

103. e.g. the Christiania Spigerverk study, 1st phase, in Emery, F.E. & Thorsrud, E. 1975; the Internal Revenue Service study, in Rush, H. 1971, where attitudes improved, but production fell, and quality improved; the study by Powell, R.M. & Schlacter, J.L. 1971 where an increase in autonomy for workers yielded no economic benefits.

104. Frank, L. & Hackman, J.R. 1975.

105. Lawler, E.E. 1970, claims there was no productivity increases in studies by Biggane & Stewart, Conant & Kilbridge, Davis & Valfer, Guest, Marks, and Walker. For evidence that there were such increases, see Biggane, J.F. & Stewart, P.A. 1963, pp. 17 (sec.2), 22, 25; Guest, R.H. 1957, p. 15, and for a report on Marks, ibid., "Thus, according to Dr. A.R.N. Marks, who made the study, ... there was improvement in both quality and productivity." (p. 13); Walker, C.R. 1950, in which it is made clear that many workers were eliminated, and labour costs reduced. And Conant, E.H. & Kilbridge, M.D. 1965, where it is made clear that

unit production time fell, and labour costs were cut, i.e. production measured over time, or money, increased.
There seemed to be no increase in productivity in Davis & Valfer, so in Lawler's 10 cases : 10 quality improvements, 9 productivity improvements - not an astounding difference! It should be noted that Lawler possibly conflates higher productivity and greater effort, and if he is referring to increased production through increased effort, the situation is a little different. The cases by Biggane & Stewart, and Conant & Kilbridge, obtained increased output by more efficient methods but even on this interpretation of Lawler's words, we still obtain 10 quality improvements and 7 increases in production via effort - once more, not a remarkable difference!

106. Locke et al., 1976.

107. Tausky & Parke, 1976.

108. Locke et al., op. cit., Tausky & Parke, ibid. Susman, G. 1976, p. 35.

109. Wilson, N.B. 1973.

110. Guest, D. & Fatchett, D. 1974, Chap. 3. also Guest, D. 1976.

111. Lawler, E.E. 111. 1971, Chap. 6.

112. Tausky & Parke, op. cit.

113. cf. Locke, E. 1969; Brayfield, A.H. & Crockett, W.H. 1956; Robinson, J.P. et al. 1969; Blum, M. & Naylor, J.C. 1968, Chap. 12; Vroom, V.H. 1964, esp. Pt.3; Warr, P.B. & Wall, T.D. 1975, Chap. 1.

114. See Cross, D. 1973.

115. cf. Schwab, D. & Cummings, L. 1970; Slocum, J.W. 1970.

116. Brayfield & Crockett, op. cit.

117. Vroom, 1964.

118. Blum & Naylor, 1968.

119. Tiffin, E.J. & McCormick, J. 1975.

120. A dual mechanism model has also been suggested by Vroom, op. cit. and by Lawler, E.E. 1973. Vroom suggests that job satisfaction results from the provision of valued rewards, job performance from the existence, and perception, of the performance-reward link.

121. See Vroom, ibid., Chap. 6. And a recent study using two moderator variables still discovered satisfaction - performance correlations of the order 0.3 or less. See Jacobs, R. & Solomon, T. 1977.

122. Conant & Kilbridge, 1965; Daniel, W.W. 1970; Goldthorpe, J.H. et al. 1968, pp. 20-24, 25-29.

123. Nicholson, N. et al. 1976.

124. Vroom, 1964, Chap. 5.

125. See Chap. 12 (below), and Lawler, E.E. & Hackman, J.R. 1971.

126. Democracy at Work. 1977, p. 45 makes a similar point.

Part Three

APPLICATIONS OF THE THEORY

CHAPTER 6 CASES IN THE LITERATURE VERTICAL ROLE INTEGRATION

Introduction

The object of this chapter is to compare the theory described in the previous chapter, as well as the conventional theories of job redesign against the data that is available from case studies and experiments in the literature. The first section discusses some of the limitations of the 'typical' case study, whilst the second discusses the strengths and weaknesses of previous reviews of the literature. The nature of the present review is then briefly described, and two problems, relating to outcome measures, and the criteria for distinguishing different categories of job redesign, are presented and considered, before the review proper.

Structure, and deficiencies, of the 'orthodox' case study

The production of an ostensibly comprehensive review of case studies of job redesign is an endeavour that is confronted almost immediately with a number of serious difficulties. The literature itself cannot be taken at face value as a reliable guide to the actual nature, and extent, of job redesign exercises, for a number of reasons. To begin with, there is evidence, in a number of case studies, that earlier job redesign exercises may have gone unrecognised as such because of the absence, or the inadequate diffusion, of a language and theory with which to describe them. Secondly, a certain amount of job redesign may result from the processes of mechanisation, and automation, both of which have been in progress, in the UK, for at least 150 years. Thirdly, certain cases may not be reported at all, except in internal company publications, for a variety of reasons: to avoid undesirable publicity, to prevent knowledge of failures, or to inhibit the 'goldfish-bowl' effect.

There is also a certain ambiguity over the contemporary use of the term job redesign, as has been indicated above (Chapter 3) so that, for example, it is sometimes confused with what we might call participation in management. Although this may well alter a worker's job content, it typically does so only for a small minority of workers, and then, only at occasional intervals, not on an ongoing basis. There are

grounds for believing that thirteen of the 111 exercises reported in the Work Research Unit Report No. 2 are cases of this type, rather than of job redesign defined as despecialisation of labour.[1]

The problem, generally speaking, of the possibly unrepresentative nature of the literature could only be solved satisfactorily through a review of almost all the literature of industrial psychology and sociology, in conjunction with a survey of the job design activities of a large sample of companies. The altogether less satisfactory alternative, to be adopted in this report, is to assume because there is data available on over 170 cases of job redesign, that such cases are reasonably representative of the universe of the phenomenon. In other words, it will be assumed that all known <u>forms</u> of job redesign are represented in the literature. It will not, however, be assumed that the literary distribution of these forms conforms to the actual distribution except for the U.S.A. and the U.K., where data is available on a large number of cases. As regards 'false' cases of job redesign, arising from confusions with other phenomena, this need present no serious problems, in view of the definition of the distinguishing feature of the phenomenon given above: that of despecialisation of labour.

A review of this sort is also confronted however with a more specific problem, one which relates to what we may call the theoretical structure of the typical case study.

The reviews by the Work Research Unit,[2] and by the authors of Work in America,[3] contain abstracts of over one hundred and thirty case studies in which information is presented under a series of headings. The location of the innovation, the year of its inception, and the number of employees affected, are the first three items. Next, we are told the 'problem(s)' which gave rise to the case, and the technique used to solve them. Typical problems include absenteeism, low productivity, and high costs, and equally typical solutions, job enlargement, group working etc. Then follow the results: human results, which include attitude changes, and changes in behaviour such as absence, quitting, grievances; and economic results, which usually cover such items as improvements in productivity, product quality, and costs of production. The review by Birchall & Wild covers all of the above categories, but also describes the initial job, before its change, changes made in the payment level or system, and the kind of preparation, e.g. brainstorming, consultation, entered into before change implementation.[4] Of course we are talking here about abstracts of case studies, and the cases themselves may well (and do in fact) contain more information than is to be found in the abstracts. But what the abstracts represent is a selection of the information deemed most relevant for an understanding of the innovation and its outcomes.

Given that this information has been selected, we must ask what criteria have informed the process, and whether such criteria do in fact generate data adequate for an understanding of the processes of interest. In this

context, two features of the case abstracts are of striking significance for an understanding of the underlying theoretical criteria, or assumptions. Under the heading 'technique used' is invariably to be found a description of changes in job content, such as increased variety, responsibility, autonomy etc. Very rarely indeed is any other 'technique' mentioned. This omission is both predictable and at the same time, curious: predictable because it signifies the assumption underlying the abstracts (as well as many of the more detailed case studies), that since changed job content changes, in turn, worker motivation, and hence performance, that this information alone is adequate for an understanding of the 'economic and human results;' but curious, insofar as writers on job redesign frequently complain that it is difficult to draw inferences about causal connections because changes in job content are typically accompanied by a host of other changes in the work place.[5] In fairness it should be stressed that some writers, e.g. Birchall & Wild, are aware of the importance of other issues, such as payment, which figures as one of their case study categories. Having said that it should, in turn, be noticed, that they provide information under the heading of payment in only ten out of ninety cases.

The second feature we should notice about the abstracts (and about many of the case studies) is their division of results into the economic and the human, and the assumption often made about this division, that it corresponds more or less, to the interests of employers and employees respectively.

'human' results typically refer to improved attitudes, fewer grievances, better industrial relations etc., whilst 'economic' results refer to absenteeism, turnover, production costs and so on. In both cases, an abstraction has been made from a process, or a phenomenon, which, in reality, has both human and economic aspects that are inextricably linked. Consider for instance, the oft reported result that employees may accept more responsibilities without at the same time requesting a pay rise. In this type of case, the employer's unit labour costs will be lowered, and the employees may be more satisfied. But the economic interests of the employees have been adversely affected here insofar as the employer has effected a shift in the wage-effort balance in his own favour.

The economic/human divorce could however, have a second justification, although it is not the one provided by job redesign theorists. It was suggested that the 'economic' and 'psychological' outcomes of job redesign could be traced to different mechanisms: higher productivity and product quality were postulated as the results of changes in payment levels and systems, supervisory, and other, control mechanisms, changed work methods, or of negotiated higher workloads. Changes in attitude and job satisfaction on the other hand, were postulated as being in part, the results of changed job content, in the direction of increased variety, autonomy etc.

The conclusion from this introductory section may then, be stated as follows: the difficulties involved in drawing

valid conclusions from the case studies of job redesign, reported in the literature, are compounded by the fact that both case abstracts, and to a lesser degree, the studies, present information in accordance with certain theoretical presuppositions. This means that the data which would be required to test alternative hypotheses, of the sort advanced here, is often omitted. Fortunately, data of the sort required to test our hypotheses has been provided in some cases (approximately half), but the reporting of outcomes is, generally speaking, so inadequate that it will only be possible to test these hypothesesfor changes in labour productivity. Other criteria, notably product quality, absenteeism rates, and turnover of labour, are reported so infrequently, that discussions of these outcomes can at most be tentative.

Previous reviews of the job redesign literature

The previous section of this chapter dealt with some of the problems inherent in case studies and case abstracts of job redesign. The case study approach, used quite frequently in job redesign, also has other problems, and it is to these that we now turn. There have been comparatively few reviews of the job redesign literature, and the first of them, published exactly ten years ago by Hulin & Blood,[6] was discussed in Chapter 3. Their principal conclusion was that job enlargement could not be assumed as universally efficacious because of individual differences in employee attitudes, although some studies did appear to provide support for job enlargement.

The next major review was by Pierce & Dunham,[7] in 1976 in which the authors sought to advance the utility of "task design" as an overall concept, embracing several different types of activity. Unfortunately, the authors reviewed only a very small number of post - 1968, experimental and case studies, including those by Ford, Maher & Overbagh, Weed, Hackman et al., and Maher. Many of the remaining studies were concerned with individual differences and other moderator variables. From this review the authors concluded (among other things) that "Affectional and motivational responses appear to be more strongly related to task design than are behavioural responses." (p. 87). A number of studies however, e.g. Locke et al., Umstot et al., have suggested the very opposite, as have more recent reviews (see below). These diametrically opposed views may well be due in part to these (inevitable) omissions from the Pierce & Dunham review, but they also stem from a failure to examine certain findings e.g. Ford, with a sufficient degree of rigour.

One problem with both of these reviews was their failure to examine in depth the external validity of their case studies, i.e. the extent to which the relationships found, between job content and performance say, may be contingent on features of the organisation or its context, such as supervision, payment systems, technology etc. Because many case studies do not supply material of this

kind, this sort of question is difficult to answer, but attempts have been made recently by Cummings et al.,[8] and by Srivastva et al.[9] Another, and even more important question, concerns the internal validity of the cases, i.e. were the observed changes in attitudes and behaviours actually due to the changes in job content, or did they have other causes? Again, Cummings et al., in a number of reviews, have attempted a systematic evaluation of methodological shortcomings in job redesign studies.

The conclusions from these reviews can be stated basically as follows: the internal validity of attitudinal findings was deemed to be significantly weaker than performance findings, insofar as the former were more amenable to interpretation in terms of mortality (loss of subjects from the groups over time), selection-interaction (differential attitude change being a response to some factor other than changed job content), and other factors. Secondly, and despite this difference, both the performance and the attitudinal outcomes were subject to a number of validity threats, such that neither could be accepted without caution, however plausible they might be. The possibility remains, in other words, that both sets of findings may be artefactual or due to factors other than job content and that even if valid, the findings may be contingent on other factors such as worker participation in job redesign.

The work of Cummings et al. is significantly superior to that of Hulin & Blood, and of Pierce & Dunham, not least because it adopts a far less negative approach to the existing literature than do the former authors. It also has the advantage of being far more systematic. Nevertheless it does have problems: firstly, although valuable as a guide to problems inherent in the literature it seems to adopt the approach that the job redesign theses are true until proved false. The effect of this position is that plausible alternative explanations (of the type advanced here) are neither articulated, considered, nor seriously assessed. Indeed, the book by Cummings and Molloy contains sections on sociotechnical theory, and job 'enrichment' which are almost wholly uncritical.

Secondly, no attempt was made to examine the outcomes of job redesign beyond the level of 'increased/decreased no change,' i.e. no quantitative findings were presented and discussed. Thirdly, the reviews of studies are far from exhaustive, and cover, in all, only 44 cases. Some of the omissions undoubtedly stem from the poor methodologies employed in many of the cases, but even several cases with methodologies of at least comparable rigour to those included seem also to have been overlooked, e.g. den Hertog,[10] Cotgrove,[11] Emery & Thorsrud,[12] Bryan,[13] Archer,[14] and Janson.[15]

The present review

The present review will attempt to incorporate some of the better points of previous reviews, but it will also try to go beyond them and engage in a systematic comparison of different theories. The purpose of this review will also be rather different from previous reviews in that its focus will be less on the validity of the findings on outcome variables, and more on the validity of job redesign theories as such.

The spirit of the review will be very much that of Cummings et al insofar as it entails the belief that the numerous limitations of the job redesign literature need to be taken into account whilst at the same time avoiding the 'trap' of rejecting almost the whole literature. The present review will concentrate on the methodologically more rigorous studies, though not exclusively, but it should be stressed that the level of rigor in this field as a whole is far from high. Consequently, any conclusions that are drawn from this review can only be tentative, first hypotheses, and must be subjected to further, and more critical test. In addition, the problems cited at the beginning of this chapter should also be borne in mind: namely, that some cases of job redesign may not have been

reported, for various reasons, which therefore brings into question the representativeness of the literature. In addition, the content of many cases that are reported leaves much to be desired. Information about job losses, wage rates, promotions etc. may be omitted, again for a variety of reasons. Detailed information on non- productive time, idle time etc. of the sort that would be obtained by work study practitioners involved in job redesign is another type of data that is frequently absent from case reports. This is not to say that such omissions are intentional, for as we shall see in Chapter 9 different sections of management may hold very different views of job redesign, and have correspondingly different ideas about what is important to report. It therefore becomes of interest to know the managerial origins of job redesign information, so that any such omissions can be remedied.

Two issues remain to be considered before we can start the review proper: the first is the type of outcome criteria that will be examined, and the second concerns the way in which the literature will be divided.

Outcome criteria

It was stated above that adequate data was only available for the outcome of "productivity," and we must now indicate more concretely how this term is to be defined and assessed. At the most general level, productivity is a measure of the

ratio of outputs to inputs for a production (of goods, or services) system.[16] Job redesign however is concerned with the organisation of labour and although it may also involve the increased utilisation of machinery, of capital, there are many situations where this is not the case. How then do we measure the input of labour? It can be done either in terms of time, or of money, or both, but in view of the relative poverty of the data on wages and salaries, the time measure will be used here. In other words we shall use as our index of labour, the man-hour which is the conventional measure in this field, and is the term used for the labour input of one man working for one hour. Productivity will be deemed to have increased where the ratio of output to man-hours has increased, which it may do in a number of ways. For instance, with constant output, the same men may each work fewer hours, or fewer men, each the same hours. In some cases of job redesign increases in productivity (as defined here) have had to be calculated from data on changes in the size of the labour force relative to output. In other cases, where a productivity increase of 'X'% has been reported, this has been taken at face value. Few cases have explicitly employed a cost-based measure of productivity, and we have also assumed therefore that, unless indicated to the contrary, the time, or man-hour, system has been used. All of these assumptions are open to question, and because of this no great reliance will be placed on overall trends or levels of productivity figures.

The next question concerns the labour which must be included in our measure - is it that of the workers whose jobs are changed? or do we also consider supervisors, maintenance workers etc., whose jobs may also be affected? And if different groups of workers are to be used in different cases, e.g. production workers only, in some instances; production workers and their supervisors in others, does this mean that the data are no longer comparable? Neither of these questions poses a serious problem for the analysis, for although different groups of workers will be compared, some of which are more heterogeneous than others, we shall in all cases be reducing different types of labour to the same unit, the man-hour. As for the question of which labour to include in the analysis, we shall feature only those categories of worker whose jobs are despecialised in the process of job redesign. Other workers, such as maintenance men, or quality control inspectors, may be affected by job redesign indirectly, but unless these effects take the form of despecialisation of labour we shall exclude them. To some extent such a procedure is unjustified because job redesign may have repercussions far beyond the boundaries of the department to which it was confined, but there simply does not exist any means for conceptualising, let alone, measuring such effects, and they are invariably not reported in case studies: hence their exclusion.

There also exists, in a number of cases, data on improvements in product quality, and on job satisfaction,

job attitudes, labour turnover and absenteeism. Where it is available, data on quality improvements, i.e. reject rates, scrap rates, or error rates, will be used, as too will reliable and valid data on job attitudes, although unfortunately data of this kind does not exist in large quantity.

Categories of job redesign

The conventional distinctions between job 'enlargement,' job 'enrichment' and autonomous group working have already been discussed (above, Chap. 3) and their inadequacies indicated. The difficulties involved in distinguishing the addition of similar tasks (job 'enlargement') from different tasks (job 'enrichment') were explored, and related to problems of measuring job content. The horizontal/vertical distinction was also objected to, on the grounds that the horizontal dimension (addition of similar, production tasks) could often entail the vertical dimension (decision-making).

There are, of course, other possible bases for distinctions: origins of the redesign, mechanisms involved, whether the change creates individual or group jobs. Each of these criteria can separate case studies into several groups, but they all have problems. For example, an individual vs. group working distinction would assign to different categories, assembly line reorganisations which in one case reduced a flowline to only two persons, and which in another case created individual units. But it is

far from clear that these two changes involve radically different mechanisms.

The distinction to be used in the present review employs the category of work roles, and rests on the following assumption. In a service or production organisation, the main products and materials flow sequentially through a series of (more or less) interdependent work roles for processing. Attached to this horizontal organisation of roles are a number of offshoots, of vertically organised roles responsible for occasional interventions in, or receipts from, the major flow of work. These vertically organised sections are responsible for such functions as maintenance, repair, materials supply and collection, cleaning, inspection and supervision. It should be noted however that some of these functions may be designed into the main flow of work, such as brief, quality checks, and the distinction between the two sets of roles is not absolute. The vertically organised (or ancillary) roles typically enjoy either lower or higher rewards and status than the horizontally organised roles, i.e. they tend to differ in these respects.

We can now draw a more rigorous distinction between different types of job redesign, all of which entail the amalgamation of different, hitherto separate, work roles. The first category involves the addition of vertical roles to an existing role (I). The second category involves the addition of horizontal roles to an existing role (II).

The third category involves the addition of both vertical and horizontal roles to an existing role (III). There are three points to be noted about these distinctions: firstly, although, as will be seen, they correspond (approximately) to the three traditional categories of job redesign, the correspondence is by no means an exact one. In any case the distinctions are based on a rather more clear cut criterion than has hitherto been suggested. Secondly, the use of work role as the principal criterion entails no judgement as to whether this role will 'enrich' its incumbent or in any other way contribute to his satisfaction. It also entails no judgement about the nature of the additional role(s). It/they may be either higher or lower in prestige, status, rewards etc. than the role currently occupied. Thirdly, this set of distinctions can be applied to any part of an organisation in which there are products or materials being processed in some way by workers, and where there may also be vertically organised roles. Thus, cleaners may experience job redesign through the addition of supervisory duties, although in a larger context, the cleaning role may itself be considered as a vertical one.

The first type of job redesign (I), which we may call vertical role integration can be illustrated in offices, by the amalgamation of the roles of clerk and quality controller, and in factories, by the combination of roles such as production, machine set-up, and simple maintenance (as happened in the case reported by Walker - see Chapter 3).

The second type of redesign (II) invariably affects a flow-line system of work, and may be called reorganisation of flow lines. Typically, a sequential, or horizontal series of work roles in product manufacture or assembly, or document processing, is contracted, or abolished, and replaced either by a shorter chain of work roles, or by individual work stations.

The third type of redesign (III) involving the combined amalgamation of horizontal and vertical roles, typically creats flexible work groups, in which labour is allocated between jobs as and when required.

Our primary distinction between categories is predicated on the notion of work roles, but as we shall see in this, and the ensuing chapters, these categories also involve different mechanisms for increasing performance. In addition they will be seen to enjoy differing relationships with scientific management, and to entail different consequences for the workers involved.

Cases and experiments in job redesign - some general points.

The theory of job redesign put forward in the previous chapter specified five mechanisms by which productivity might be raised, product quality improved and labour intensified, under job redesign. These were: pay rises and incentives, elimination of labour and raising of performance standards, enhanced accountability and control, work methods improvements, and employee intrinsic motivation.

At a general level we can ascertain whether two of these mechanisms are at all relevant by examining their incidence among cases and experiments in the field, where upon we find the following:

TABLE 1 Incidence of Pay Rises and Labour Elimination in cases of job redesign

	Pay Rises			Labour Elimination	
	A	B		A	B
Yes	58	27	Yes	78	38
No	33	14	No	39	19
Don't Know	103	42	Don't Know	77	26
TOTAL	194	83		194	83

N.B. Column A lists information for all known cases of job redesign for which at least one written reference is available. [17]

Column B lists information only for cases where the magnitude of any increase in productivity is actually known.[18]

Column A includes all cases in Column B.

Had these figures shown that pay rises were rarely given, or labour rarely eliminated (i.e. transferred, resigned, or made redundant), then we could say immediately that our theory was implausible. But as matters stand, such a view cannot be maintained. If we leave aside, for the moment,

cases where changes in pay levels and labour volume are unknown, then it appears that pay rises and labour elimination figured in 60-66% of all known cases of job redesign, and in the same proportion of cases with known productivity increases. At the very least then it must be said that the prevalence of these phenomena hardly merits their diminutive treatment by theorists in the area.

If we examine the distribution of these two phenomena across the three categories of job redesign outlined above, then we find the following:

TABLE 2 Distribution of cases with pay rises and labour elimination across different categories of job redesign. [19]

	Categories			
Pay rises given	I	II	III	
Yes	6	0	21	
No	8	3	3	
Don't know	12	24	6	
TOTALS	26	27	30	= 83
Labour eliminated				
Yes	11	13	14	
No	8	3	8	
Don't know	7	11	8	
TOTALS	26	27	30	= 83

The figures are, of course, difficult to interpret because of the large numbers of cases in which information is unavailable, but despite this it can still be seen that in all three categories the elimination of labour is a significant phenomenon, albeit perhaps to differing degrees, whilst the same appears to be true, possibly to a lesser extent, for pay rises. And the intercategory differences in pay rises are certainly striking.

These two phenomena are also significantly interrelated, as the following table shows. Once again however it should be noted that information is available here on only 73 of the 194 known cases, and on only 32 of the 83 cases with known productivity outcomes (these latter figures are shown in brackets):

TABLE 3 Relationships between pay rises and labour elimination in cases of job redesign. 20

		Labour eliminated		
		Yes	No	Totals
Pay raised	Yes	32 (17)	11 (6)	43 (23)
	No	10 (4)	20 (5)	30 (9)
	Totals	42 (21)	31 (11)	73 (32)

Major figures $\chi^2 = 17.04$, df = 1, $p<.001$

Figures in brackets $p = .08$ (Fisher test)

This inter-relationship between pay rises and labour elimination will also require some consideration and discussion at a later stage.

* * * *

Cases and experiments in job redesign

The following literature review, as already indicated will be concerned principally with theoretical explanations of changes (or their absence) in job performance as a result of job redesign, although other outcomes, such as quality improvements, or attitude changes, will be considered where possible. The review will not therefore examine the large correlational literature on job content and job attitudes. Despite the undoubted interest and importance of this literature, it cannot answer questions about causal relationships, nor about changes in job performance.

The review will be organised under the headings of the three categories already mentioned. Under each of these categories, several of the major, and more rigorous case studies and experiments will first be discussed, and the problems, and limitations of the conventional theories of job redesign will be indicated. At the same time attempts will be made to show how the theory of job redesign described in the previous chapter may be used both to explain the performance outcomes in these cases as well as to integrate seemingly discrepant data. The next section will briefly discuss improvements in product, or service quality, and the possible explanations for these. The final section of each category discussion will then pursue the relationship between the work reviewed, and the theory and practice of scientific management.

Category I

Vertical role integration
Case studies and experiments[21]

We shall begin with a discussion of several cases involving blue collar workers because although they have methodological deficiencies, they can also provide illustrations in support of the theory outlined previously. We shall then proceed to examine some of the better, white collar cases.

The earliest example of this type of case was reported by Walker in 1950 (57). The division of labour in a number of machine shops was reorganised so that the machine operatives no longer simply fed the machine, turned it on, and picked up the output. They were also assigned the tasks of setting up the machine, of carrying out minor maintenance duties, and of inspecting the products. In this situation, division of labour had been taken to the point where none of these groups of workers had, or could be guaranteed, a 'full' workload (in Taylor's sense) and the division was thus counter-productive. Each group of workers could only carry out their work whilst at least one of the others was idle, and this inefficiency was transcended by assigning all duties to the operative. At the same time 35 setters and checkers were eliminated. And because so much labour was eliminated higher wages could be paid at the same time as total labour costs fell, according to the classic Taylorian formula. A similar case was reported by

Powers (18), which also entailed labour elimination.

In both of these cases it might be argued that higher productivity arose from increased motivation due to the variety and responsibility involved in the new jobs, and that the elimination of labour was a consequence, or by-product of this. But why did the employees accept the new jobs in the first place? And why did this result in increased output per man, rather than (as some writers have suggested it should), increased product quality? In the absence of attitude surveys of the employees no definitive answers can be given. But it can be suggested that in both cases employees accepted higher levels of effort expenditure in return for higher wages. The elimination of labour was based on this "agreement" and was not reported as following, some time later, the redesign of jobs. Rather the redesign of jobs resulted in the elimination of labour, which served, at the same time to "enforce" higher, individual workloads, since the total volume of work to be done had now to be performed by fewer workers.

There are other cases that have involved labour elimination, but where it would seem difficult to defend a theory of motivation and performance based on job content. Rush, for instance, describes a case in which the operatives of twisting frames, in fibre glass manufacture were 'assigned' the job of frame cleaning (23). The assignment is unlikely to have been eagerly accepted by the workers since, as Rush states, the job of frame cleaning was 'unskilled, disliked,

dirty, boring, low status and low paid.' Yet the fact remains that this work, performed by 28 cleaners was assigned in toto to the 92 frame operatives and the whole process was achieved without a pay rise. The fact that the plant had no recognised trade union may be relevant here in accounting for the absence of any apparent benefits for the frame operatives, and one can only suggest that management simply exercised its uncontested authority to effect this change, or else convinced the workers of the economic necessity for such changes, or both. Certainly, the intrinsic merits of the job would not account for its acceptance, and performance, by the workforce. The other alternative explanation is that insofar as the job of frame twisting, as with that of machine operative in Walker's case study, involves a considerable amount of 'machine minding,' operatives may have welcomed any extra duties because they helped pass the time. This appeared to be the case, to some degree, in the study by Cotgrove which suggested that the increased effort necessitated by job redesign was appreciated because it helped speed the passage of time (3).

In this study, involving over two thousand employees in a British textile plant, loom operatives were assigned a number of minor maintenance duties, to be carried out either before the machines started up, or when they had broken down. In other words, portions of unoccupied time within the operative's working day were filled up, and (the other side of the coin), the maintenance labour force was reduced by 14-15%. Had this not been done, the same

(approximate) level of output would have been obtained with the same volume of labour: the productivity of labour would not, in other words, have increased, and the same point holds true for the previous cases. Again, we must ask why did employees accept these arrangements and agree to perform extra duties? It was not because the duties were more highly motivating, for in this case the extra duties were negotiated between unions and management, and accepted by unions and workforce in advance. The inducement to accept these arrangements was an increase in pay of approximately £3 per week, on average.

It may be more useful then to interpret these kinds of cases in terms of negotiated changes in the wage-effort bargain. Employees put out higher levels of effort in return for higher earnings, and labour productivity is enhanced by labour elimination. The Rush case is an exception here, but we have already noted that job redesign theories could not account for these outcomes either.

All of these cases have involved blue collar workers, and two of the mechanisms postulated in the theory described previously, viz. pay rises, and labour elimination and raised individual workloads. There is little evidence to suggest the existence of specific work methods improvements in this category of job redesign, (apart from the case reported by Weed, and by Rush, in which cleaners were supplied with improved materials and appliances), so what productivity outcomes have been achieved in the absence of these mechanisms among blue collar workers? Without labour

elimination or pay rises, or the introduction of pay incentives, we find only small or non-existent increases in productivity in situations where increased effort expenditure could, in principle, have increased output: Agersnap et al., 0% (1); Paul & Robertson (toolsetters case), 3.9% (17); Wyatt & Fraser, 3-4% (26). The one blue collar case which deviates from this pattern was written up by Hill and reported a productivity increase of 20% (7). But this increase derived both from the delegation of extra duties (in this case, maintenance work) to operatives, as well as from a variety of technical suggestions advanced by the employees. It is impossible therefore to disentangle the effects of these two factors.

Let us turn now to studies of white collar workers. As with the blue collar cases reported above, many of these suffer from the absence of control groups, and the failure to employ measures of job attitudes. But this is by no means universally true, as shown in the study by Locke et al. (11). This study explicitly set out to investigate the mechanisms of job redesign, the role of pay increases, and the relation between attitudes and behaviour. As such, it provides one of the closest approximations in the literature to a test of our theory. Three different types of job change were introduced (each with matched control groups) in the clerical section of a local government agency involving respectively, increased control over labour allocation, and task variety; increased decision-making, liasion, and control of work scheduling;

and increased variety and reduced external control. A job attitude questionnaire was administered both before, and six months after the start of the change programme. The results are summarised below:

TABLE 4 Results of the study by Locke et al. (1976)

Measure	Experimental Groups (N=46)	Control Groups (N=49)
Productivity	+ 23%	+ 2%
Absenteeism	- 5%	+ 7%
Turnover	- 6%	+ 20%
Complaints and disciplinary actions	0	4
Attitudes	no change	no change

The changes in productivity were attributed by Locke et al. to improved utilisation of labour (employees moved from job to job as required), elimination of unnecessary procedures, more feedback on performance, and, in one group, inter-individual competition.

The lack of improvement in attitudes was attributed to the disappointment at the absence of anticipated pay rises, which the authors argued was the main reason employees sought higher-grade and more challenging work. The study thus confirms a number of the propositions of our theory.

The existence of attitude-performance discrepancies has also been revealed in studies by Umstot et al[22] and Paul & Robertson on white collar workers (16). These studies involved the delegation of higher administrative and managerial duties, including scope of decision-making, to groups such as sales representatives, design engineers, experimental officers, draughtsmen, and foremen. They used the Job Reaction Survey, J.R.S., a measure designed by Herzberg himself to tap employee job perceptions along the 'motivator' dimensions. Scores on this scale can range from 0 to 80, and the results for sales representatives are shown below.

TABLE 5 J.R.S. Results for sales representatives from Paul & Robertson (1970)

	Pre-job changes	Post-changes
(N = 15) Experimental group	50.1	55.4
(N = 23) Control group	51.8	52.0

This difference is very small indeed and assuming a standard deviation of only 2 or 3 points, is unlikely to be statistically significant. Although quantitative performance data are unavailable for the other four groups in the study, ratings by superiors, and other indices, suggest there were definite performance improvements in all cases. With one exception - that of the design engineers -

- the results, in all probability, show no statistical differences in attitudes between experimental and control groups after job redesign. In other words performance effects may appear quite independently of attitudinal change in the cases reported here perhaps because job attitudes were favourable at the outset. Job redesign may therefore have 'allowed' the emergence of behaviours for which there existed previously no adequate outlet, rather than being the cause or effect of those behaviours as postulated by Herzberg, and Hackman et al.

Pay levels and systems, and volume of labour remained unchanged throughout all of these studies, and there was little systematic evidence of work methods improvements. The explanation of changes in job performance may therefore require some resort to one or other of the 'classical' theories of job redesign, with their stress on intrinsic motivation, especially in view of the highly skilled (and probably motivated) nature of the employees in these studies.

The study by Morse & Reimer also failed to discover any simple correlation between job performance and overall job satisfaction, following an increase in autonomy for clerical workers (13).

TABLE 6 Results of the study by Morse & Reimer

		Experimental	
		Pre-change	Post-change
Mean scores on 5 point scale.	Index of productivity	48.6	58.6**
	Overall job satisfaction.	3.16	3.19
	Feelings of self actualisation	2.43	2.57*

* Significant at $p < .05$ 1-tailed t-test.
** " " $p < .01$

The label 'control' group is a slight misnomer here, since this group experienced a reduction in autonomy, rather than a situation of no change. The assessment of 'feelings of self-actualisation' was also somewhat misleading since four of the five items on this scale simply tapped job perceptions, whilst only one - on the challenge in the job - invited any kind of evaluation, and it was perhaps not surprising that the changes occurred in the directions they did.

The study also showed however that a reduction in employee control over their immediate work could yield a productivity increase. In addition, some (unknown) portion of the 21% productivity increase in the experimental group was due to work methods improvements suggested by the employees.

The classic study by Ford at A.T. & T. should also be described here (29). 120 clerical workers (70% of whom were college graduates) were involved in the study. Two groups, (total N = 36) were allowed to sign the letters they wrote, to choose the form of the letter, to dispense with external verification, and were to be held responsible for the quality of their work (previously, supervisors had been responsible). Three groups (N = 59) acted as controls. Employees were asked to fill out the Herzberg J.R.S. (see above), and performance was measured by a Customer Service Index (C.S.I.), a combined measure of work speed and quality.

Results are shown below:

TABLE 7 Results of the study by Ford (1969)

	Groups	Customer service index		J.R.S. scores	
		April	Sept.	March	Sept.
Experimental	I	33	88	39	55
	II	40	94	46	48
Control	III	52	73	41	37
	IV	42	76	42	43
	V	50	78	43	41

Throughout this period there seems to have been a general increase in work volume, since all groups showed improved rates of performance, with the experimental groups both improving their C.S.I. scores by a greater margin than the control groups. And if we look at the J.R.S. scores we can see that the control groups showed (in all probability) no significant differences. But then nor did one of the experimental groups (group II), and yet their C.S.I. score rose to the highest level of all five groups in the study. Again we see there is no simple correlation between performance and job perceptions.

No pay rises were given in this study, and labour was not eliminated, but one of our postulated mechanisms did change. Formal accountability for job performance was vested in the clerks themselves, rather than their supervisors, and deviations from required performance standards would thus have been brought more directly to the clerks' notice than before. This may well account for improved performance by the experimental groups.

The classical theories of job redesign would have difficulties with all of these cases, Locke et al., Paul & Robertson, Morse & Reimer, and Ford. The principal task design theorists, Hackman, Lawler and Oldham have postulated i) that it is perceived rather than actual job content which is motivating, and ii) that jobs must be changed on each of the dimensions of autonomy, variety and task significance for improved motivation. All of the above cases showed instances of performance improvements in the absence of changed job attitudes and perceptions, and showed instances of similar improvements with changes only in autonomy and variety. This latter point contradicts the conclusions of Lawler et al. who introduced (perceived) minor changes into the jobs of telephonists, and found no changes in job satisfaction, motivation, or in productivity. They thus concluded the Hackman et al. propositions (above) were supported, although as we have shown several studies contradict this view.

Equally, if one examines the Herzberg postulate of increased satisfaction, motivation and performance as a result

of "job enrichment," then the occurence of performance improvements in the absence of changes in satisfaction, and job perceptions must indicate a deficiency in the theory. The importance of pay increases need not contradict job 'enrichment' theory since (a) Herzberg did not deny their efficacy (though he thought it limited), and (b) he could argue that workers responding to pay increases were motivationally "sick," and hence outside the scope of his theory. We shall see however, when comparing productivity increases, with and without pay rises, that no significant difference can be seen, and this fact must surely contradict Herzberg's view.

Sociotechnical systems theory cannot be considered, in its present form, to apply to the cases of job redesign in this category. It was designed to account for problems, forms, and outcomes of group working, whereas the cases in this category have all involved largely independent, individual work roles. There is of course a more recent strand of development within the sociotechnical 'school' which has explicated a set of dimensions along which jobs should be changed in order to improve motivation and satisfaction. As indicated elsewhere however it has not been made clear whether performance improvements require changes on all of these dimensions, or whether it is sufficient merely to change some of them. Certainly the former view would seem to be contradicted by some of the findings reported above.

There are of course studies which do appear to be consistent with classical theories of job redesign and the

study by Janson is typical (8). A group of production typists was responsible for typing blocks of information onto computer tapes. After some analysis of their own and various ancillary operations, it was decided to allow them to dispense with supervisory verification of their work, and to correct their own mistakes. They were also allowed to change their own computer tapes - a job previously carried out by supervisors, and were assigned responsibility for a particular group of companies, thus permitting easier identification of the source of errors. Number of blocks typed per hour rose from 70 to 85 in the experimental group, but remained at 68 in the control group, whilst the number of errors per week fell from 15-20 to less than 5, the figure for the control group again remaining constant. Scores on the Job Reaction Survey are shown below:

TABLE 8 J.R.S. Scores for employees in the study by Janson (1971)

	Sept. 1969	March 1970	
Experimental group	50	60	N = 40
Control group	53	47	N = 40

Similar results were obtained in another study reported by the same author, and in studies by Bryan (2), Gorman & Molloy (6), Kraft (9), Maher & Overbagh (12). and Randall (20). S everal of these cases did not utilise control groups

however, although all of them reported improvements either in performance or product quality. In some cases, e.g. Gorman & Molloy, Maher & Overbagh, higher wages were paid for the new jobs, and indeed in the former case employees were so concerned to maintain their level of earnings that they strongly resisted the introduction of a group bonus scheme, fearing that an influx of new employees would lower their earnings. The other cases however conform to the predicted job redesign pattern - changed job content was followed by improved performance and attitudes. In the next section we examine, very briefly, improvements in product quality. The following section will then examine this type of job redesign at a more general level, and the final section will assess its relation to scientific management.

Quality improvements

Several of the case studies discussed above reported improvements in product quality, or reductions in error rates. The majority of these were not subjected to tests of statistical significance, although if the figures are taken at face value, then some of them certainly appear to have been significant. The data reported by Ford indicated both work quality, and quantity and suggested there was an improvement in the experimental, as compared with the control groups. A case study of inspectors by Maher & Overbagh in which inspectors were assigned more autonomy and responsibility, showed a reduction in defective products, after 9 months, from

7% to 2.5%, although no control group was used. Paul & Robertson carried out a study of tool setters in which the men were given responsibility for product quality, from a particular group of machines, and for ensuring proper use of machinery. Although there were other factors involved with the rate of rejects, and the control group was inadequate, the figures showed no improvement in the scrap proportion after five months. A study by Janson yielded rather different results: a group of production typists was allowed to verify its own work, change their tapes, and was given quicker feedback on performance. After six months, errors per week fell from 15-20 in the experimental group, to less than 5, whilst the control group remained at the same level, 15-20 per week.

Clearly many other factors may have been responsible for these improvements in quality apart from those posited by theories of job redesign. It is interesting to note, for instance, that work quality and quantity improvements were found in the control as well as the experimental groups, in the study by Ford, and it would seem therefore that these outcomes are subject to many influences. But in the studies cited above, as well as in others, one point is worthy of note. Employees were often given more direct and/or more precise feedback on their performance: it may be the case that this was motivating in, and of itself, but it is also possible that feedback "merely" facilitated the performance of employees who were already motivated to perform well. All of the cases (but one) involved white collar, clerical workers,

and, certainly in the Ford study, a high proportion (70%) of these were college graduates whom one might expect to hold more intrinsically-centred orientations to work.

Theories of job redesign which stress the importance of intrinsic motivation may therefore provide an explanation for some of these quality improvement data.

General points and issues

Data on changes in productivity exists in 26 cases of category I job redesign. If we examine the incidence of pay rises and labour elimination - two of the principal mechanisms referred to in the theory presented here - we find the following:[23]

TABLE 19 Relationships between pay rises and labour elimination in cases of vertical role integration.

		Labour eliminated	No labour eliminated	Don't know
Numbers of cases	Pay rises given	5	0	1
	No pay rises given	1	5	2
	Don't know	5	3	4

N = 26

What this tells us is that at least twelve (almost half) of these 26 cases entailed the provision of pay rises and/or the elimination of labour. Given the large number of 'Don't knows' in the table it is difficult to indicate the extensive-

-ness of these two mechanisms. All we can say, so far, is that their occurrence in almost 50% of the cases with reasonably reliable productivity data gives us some confidence in their significance.

However if we look at the magnitude of productivity increase according to the presence or absence of these two mechanisms, we find the following:

TABLE 10 Median productivity increases as a function of pay rises and labour elimination in cases of vertical role integration.[24]

		N			N
Labour eliminated	49.5%	11	Pay rise	22.0%	6
No labour eliminated	2.0%	8	No pay rise	18.3%	8
Don't know	15.0%	7	Don't know	13.5%	12
	19.3%	26		19.3%	26

$U = 2$, $p < .001$ (one tailed) $U = 11$, $p = .054$

Clearly, labour elimination appears to be associated with significantly higher degrees of productivity increase than in its absence, but the same does not seem to hold to the same extent for pay rises. This however does not mean that pay rises should be seen as ineffective, for our theory does not stipulate that pay rises are the only mechanism at work under job redesign. For certain groups of employees, redesigned jobs may in themselves motivate the workers in question to higher and/or better quality performance. If this is the case, then the effects of pay rises overall may be masked.

Category I

Job redesign and scientific management

The following table lists the duties that have been assigned to workers in cases of category I job redesign:

TABLE 11 Additional duties assigned to workers in cases of vertical role integration

Answer clients' queries	Inspection/testing
Maintenance	Work scheduling
Machine set-up/tool setting	Responsibility/accountability
Paperwork/documentation	Participation in decision-making
Cleaning	Sign letters
Materials supply	Labour allocation
	Authority for decision-making

These duties can be broadly divided into two sets: the first set includes work traditionally carried out by manual or lower-grade clerical workers, and is listed in the lefthand column; the righthand column, on the other hand, lists duties which have more commonly been performed by supervisors and managers, i.e. by those with authority over manual and clerical workers.

The rationale for the combination of various manual or clerical work roles is that savings in labour costs can be realised since each of these roles, in itself, is insufficient to occupy a worker for the duration of the working day. Taylor himself recognised the existence of

such fractional work roles, and ironically, the example he gave was that of cleaning and maintenance, suggesting that the two could, under certain conditions, be combined. Cleaning work has in fact been assigned to machine operatives in two cases of job redesign, although in general the extra duties assigned usually required more, not less skill than current duties. If we understand that Taylor sought to assign maximum workloads to as cheap a degree of labour as possible (rather than to maximise division of labour), then the relocation of maintenance, inspection etc. can be seen as a development that is quite in line with Taylorist principles.

McBeath was more explicit about the affinity between job redesign and scientific management, when reporting a case in which welders lost some of their simpler duties to a new grade of assistant welder, while simultaneously acquiring some of the work previously undertaken by supervision:

> "Strictly speaking, this regrouping of work may be considered as "deskilling" some jobs. However, the deskilled work did not require higher skills anyway,....." (p. 123).

Indeed it may be considered as deskilling, and the way one considers the process depends very much on the standpoint from which it is viewed, that of the worker losing duties, or of the worker who acquires them in a process of 'enrichment.'

If we examine the second type of labour transferred down the status hierarchy, namely 'managerial' labour, then we can say that this violates the separation of execution and conception argued for by Taylor. In this regard only

may vertical role integration be said to have transcended Taylorism. The abandonment of the Taylorist principle here is clearly of some significance, but it should not be over-estimated. The overall division of managerial and non-managerial labour persists despite the introduction of job redesign, and it may be that this abiding division can only be transformed by mechanisms of participation and representation, rather than job redesign (see also Chapter 5, on power and control).

Summary of conclusions

We have seen in this analysis of category I job redesign, vertical role integration, that,

(a) productivity has been increased, to a considerable degree, in proportion to the volume of labour eliminated, and that in the absence of such elimination, increases in output have been of small magnitude.

(b) where moderate productivity increases have been obtained in the absence of labour elimination, these could be attributed either to the effect of pay rises, or to technical suggestions advanced by employees, or could, alternatively, be construed as the outcomes arising from the behaviour of intrinsically motivated employees acting in accordance with job redesign theory.

(c) pay rises were associated with labour elimination (and their absence with its absence), and may be a means both for raising effort expenditure and for securing acceptance of job reductions.

(d) there were several cases of independent variations in job performance, and job attitudes and satisfaction, thus suggesting they need <u>not</u> be associated as theories of job redesign predict, and also confirming the dual-mechanism theory of job attitudes and job performance.

(e) approximately half the cases of productivity increases may have involved no pay rises or labour elimination, and to explain these outcomes, as well as improvements in product or service quality, one may need to employ one or more of the conventional theories of job redesign.

(f) the relationship between category I redesign and Taylorism was said to depend on the type of labour that was added to existing work roles. Where the labour was predominantly manual in character, then the activity was seen as being consistent with the Taylorist objective of achieving 'a full day's work,' and was thought not to have violated any of its other precepts. On the other hand where workers were permitted to perform 'managerial' functions, then this type of exercise was seen as a violation of the Taylorist desire to divorce managerial and 'manual' labour.

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5. cf. Warr, P. & Wall, T.D. 1975 for some of these other factors.

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10. den Hertog, F. 1974.

11. Cotgrove, S. et al. 1971.

12. Emery, F.E. & Thorsrud, E. 1975.

13. Bryan, E.J. 1975.

14. Archer, J.T. 1975.

15. Janson, R. 1971.

16. cf. Faraday, J.E. 1971, and contributions in Dunlop, J.T. & Diatchenko, V.P. 1964.

17. The 194 cases of job redesign referred to here are listed under the headings of Categories, I, II, III, and 'mixed,' at the end of this, and of the next two chapters. Each case has been assigned an index number, which will be used throughout the next three chapters.

18. The 83 cases of job redesign with known productivity outcomes are listed under category headings I, II, III at the ends of this, and the next two chapters.

19. The 83 cases here correspond to those in the previous footnote.

20. Case index numbers are as follows: 2,3,6,7,10,14,16,17, 18,19,22, 23, 24, 28, 29, 31, 41, 42, 43, 44, 45, 52, 57,

61, 78, 79, 96, 98, 100, 101, 104, 106, 107, 109, 114, 115, 116, 117 - 19, 120, 122, 124, 125, 128, 131-2, 136-7, 138, 140-1, 143-5, 148, 150-1, 159, 160, 161, 164, 165, 168, 174, 176-7, 179-81, 185, 189-91.

21. Case index numbers 1-26.

22. Umstot, D. et al. Effects of job enrichment and task goals on satisfaction and productivity: implications for job design. J. Appl. Psychol., 61(4), 1976. Because of the complexity of this experiment it has not been placed into any of our categories.

23. Case index numbers 1-26.

24. Case index numbers 1-26.

Category I:

Vertical role integration

Cases and experiments with known productivity outcomes

(N = 26)

1. Agersnap, F. et al. 1974. (N. Foss Electric).

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11. Locke, E. et al. 1976. (Group B)

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28. den Hertog, F., 1974, pp. 25-27.

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30. Foulkes, F.K. 1969. pp. 145-6.

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33. Hackman, J.R. 1975.

34. Herzberg, F. & Rafalko, E.A. 1975.

35. Hill, P. 1971, pp. 131-32.

36. Jacobs, C. 1975

37. Jenkins, D. 1974. (Barry Corporation).

38-9. Lindholm, R. & Norstedt, J.P. 1975 (Two cases - pp. 39-41; 41-43).

40. McBeath, G. 1974, pp. 122-3.

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42-5. Paul, W. & Robertson, K.B. 1970. (Design engineers E.O.'s, Draughtsmen, Foremen).

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47-8. Rush, H. 1971. (Arapahoe/Monsanto Textiles).

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50. Sirota, D. 1973 B (Case B).

51. Sirota, D. & Wolfson, A.D. 1972. (Case 1).

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CHAPTER 7 CASES IN THE LITERATURE : REORGANISATION OF FLOW LINES

Case studies and experiments

One of the most detailed studies in this category was reported by Conant & Kilbridge. They took a 6-man line, assembling domestic appliances, and transformed it into five individual work stations at which each operator performed the task previously divided between himself and his five co-workers[61]. Unit production time was said to be 1.77 minutes and this time was divided as follows:

TABLE 12 Production times on flow lines and individual work stations

	6 man line	Individual assembly
Actual unit production time	1.39 mins.	1.39 mins.
Non-productive time	0.30 mins.	0.10 mins.
Balance delay time	0.08 mins.	0.00 mins.
Average Total production time	1.77	1.49

In other words, 21.5% of 'working time,' (0.38 mins.), i.e. non-break time, was being spent 'idly,' or on tasks, such as product handling, and tool setting, which were not strictly necessary or desirable. The effect of the switch to individual assembly was to eliminate entirely the small

amount of balance-delay time, since worker inter-dependencies had been removed, and to cut by two-thirds non-productive time. Total production time was therefore cut by 15.8%, and labour costs were reduced from $19,900 to $16,762, i.e. one of the six workers was eliminated, so the 6-man line was replaced by 5 individual work stations.

What happened then to production volume? Assuming for the moment, a continuous working day of 8 hours, i.e. 480 minutes, output per day per man = 480/1.77 = 271 units, and output per line = 271 x 6 = 1626 units. On individual assembly, output per man per day = 480/1.49 = 322, and output per day, for five men, = 322 x 5 = 1610 units. Total production with the five work stations was, therefore, more or less the same as with the six-man flow line, and this increase in productivity of 20% was achieved in two ways. Non-productive time was replaced by productive time, whilst balance-delay time, previously spent 'idly,' was also consumed productively. The first change need involve no increase in effort on the part of the workers, since it merely substitutes one set of activities for another, whilst the second change involves a direct increase in effort expenditure. On the figures given, the former change accounted for some 70% of the productivity increase, the latter 30%, i.e. 14% and 6% productivity increases respectively. The former change requires no further explanation, but what of the latter? No pay increase was given in this case, and the report by Conant & Kilbridge merely states that management

was able to capitalise on the extra time 'liberated' by the job changes. Nor does the attitude data give us much clue either, for a substantial minority of workers liked both bench and line work, whilst most of the grievances about bench work focussed on changes in the wage-effort bargain. It should be recalled however that the workers were paid by incentives, and the removal of constraints inherent in the assembly line may have allowed employees to achieve more easily desired levels of earnings.

Product quality also improved in this case, with rejects falling from 2.9 to 1.4% of the total production. Job redesign theorists might argue this reflects the increased responsibility which the employees took for their work, but it could also be explained by reference to the fact that on the assembly line (which was mechanically paced) operators frequently had little time to correct defects, and the control inspectors were few in number. Individual working allowed the precise assignment of responsibility for defects, i.e. accountability was individualised and augmented.

In a similar case reported by Biggane & Stewart (60), quality testing was originally carried out by one member of a five man assembly line, and feedback of results would therefore have been fairly quick, and to that extent, arguably effective. Under job redesign the flow line was replaced by individual assembly stations at which operators (fewer in number) assembled and tested the whole product. Cycle time increased from 0.33 ms. to approximately 1.5 ms.

The individualisation of work made accountability much easier to operate, and it was reinforced by requiring each operator to stamp his product with a personal identification mark. Rejects fell from 5% of total production to 0.5%, a much greater fall than in the Conant & Kilbridge study where accountability was high, but not reinforced by personal stigmata. The same volume of production was achieved with three individual stations as had been obtained from a five man line (including one relief man), and workers continued to be paid incentives.

Wild, (82,83) reported two cases which also illustrate the two mechanisms of method improvements and intensification of labour referred to above. In the first case, involving the assembly of floor sweepers, an 8-station flow line was replaced by two-station lines, as a result of which balancing losses fell from 9% to 2% of total work time, whilst cycle time rose from 35-45 secs., to 2-4 minutes. There would also have been a reduction in non-productive motions, such as product handling in this case, but no figures were given. Again by reducing worker inter-dependencies, certain barriers to higher performance were removed, and the second case was similar.

Another study was reported by van Gils (80), but this was in the white collar sector. The overall job was to prepare materials for a computer, and the material in question passed through a flow line organisation made up of clerical groups, punching groups, control punching group,

tabulating group, clerical group, correcting group and final tabulating group. After reorganisation each worker performed a variety of operations instead of just one. An attitude survey administered after the changes had been introduced found that 88% of the 60 employees preferred the new organisation of work, and that they scored significantly higher than a control group on both intrinsic and general job satisfaction. An index of productivity showed the following results over a three month period:

TABLE 13 Results of the study by van Gils (1969)

	Oct	Nov	Dec
Experimental group	110	116	122
Control group	100	100	104

Similar findings were obtained in a case by Kraft & Williams[70], in the Deposit Accounting Division of a New York bank.

Both of these cases, but in particular the van Gils case, might suggest that improved job attitudes and job satisfaction are necessarily and intimately connected with improvements in job performance. But one can find cases here, as in the previous category, where job performance changed whilst attitudes remained constant. Gallegos & Phelan[66] studied blue collar workers in the Pacific Telephone Company. In the first study the experimental

group of wire-connectors was allowed to perform a 'whole' job, and was provided with appropriate training. After eight months the output of the 26 experimental workers had increased by 50% compared with that of the control group, but job satisfaction (measured by the J.D.I.) showed no significant change. In a second experiment, using a test-retest design, similar job changes with nine workers also failed to elicit any increase in job satisfaction. Customer complaints - a crude measure of performance quality - did however decline.

It is possible then for job performance to improve whilst attitudes are constant, and it is therefore impossible to explain the performance changes by means of attitude changes. Other explanations can however be offered: in the first case, the experimental employees were supplied with information on promotion prospects, whilst in the second, the employees were actually upgraded and received an appropriate pay increase. One can thus argue that the possibility or the actuality of a pay increase could have accounted for improved job performance.

Questions arising from the cases: mechanisms of productivity increases

In each of the cases described a certain portion of the increased productivity (70% in the Conant & Kilbridge study)

can be attributed to the substitution of productive time and productive labour for time and labour previously consumed in product handling etc. Yet there remains a portion of the increase which is not due to such methods improvements, and there also remains to be explained the improvements in product quality that are typically reported.

Let us first of all then consider productivity increases. In discussing job redesign of type II, it should be borne in mind that duties are not taken from workers of higher grades, and that the changes made are, by some standards, far from momentous. In the Biggane & Stewart study, cycle time was increased from 0.33 mins. to 1.5 mins; in the Conant & Kilbridge study, from 0.78 to 3.15 mins; in the Wild study, from 35-45 secs. to 2.4 mins. Assuming an effective daily working time of six hours, the same operation will still be repeated to a considerable degree, between one and two hundred times daily. On the other hand, it could be said the difference is very large - of the order of several hundred per cent, but considerable repetition does remain.

Secondly, we know that in several cases the workers involved were paid some form of incentive or pay rise, either in addition to a flat rate, or as a straight piecework payment. To be precise, in seven cases whose payment systems are known, three involved individual bonuses, one a group bonus, and another was an individual piecework system. The median productivity increase in these cases was 37½, but in two other cases with flat rate payment

systems productivity increases of 2% and 0% respectively were recorded.[3] In none of these cases were incentives introduced, although the basis of their payment (individual or group) did change in two of them. We also know that changes of this sort (type II) have been introduced in several cases (Wild, Biggane & Stewart, Conant & Kilbridge) to reduce balancing losses, and increase labour utilisation. If these points are combined, it could then be argued that under flow line organisation workers are sometimes obstructed in their efforts to earn money by 'balancing losses' and idle time (due to poor materials supply for instance). Under individual assembly, materials supply must be considerably improved for there is now a whole series of individual benches to be supplied with parts, rather than the starting point of one flow line, as previously. We could therefore argue that the elimination of balancing losses, and the improvement in materials supply, in conjunction with the existence of pay incentives, enable workers to increase their output in pursuit of earnings. Despecialisation of labour could thus be seen as a facilitating mechanism, rather than the cause, per se, of output increases.

Some indirect evidence that this may be the case is provided by the findings in a number of studies. Thornely & Valentine[(72)] investigated worker perceptions of their jobs, pre- and post-change, and found that workers on flow-lines and unit assembly did differ in their perceptions of variety and use of abilities on the job. Thus it might seem that

since there were perceptual changes on two job dimensions, there was some support for job redesign theory, á la Hackman et al. But against this should be set the fact that perceptions on other dimensions - learning, autonomy, future opportunities, task identity showed no such differences. How are we to evaluate the theory? I would suggest that if we examine other attitude changes we can find some clue to this question. The two groups differed significantly in their appreciation of the effects of others' mistakes on their own work (seen to be less in unit assembly), and of the existence of 'starting and finishing in the job' (again, there was seen to be less on unit assembly). These perceptions are as one would expect in a situation where balance-delay time was eliminated, along with worker inter-dependencies; whilst, at the same time, only two of the job perception statements on which one would expect unit-flow line differences on the basis of Hackman et al., in fact show such differences.

If we consider the work of Tuggle (78-9) a similar argument can be made. On the flow line, balancing losses and worker inter-dependencies necessarily inhibit some workers from functioning at their optimum, or preferred pace. In the situation described by Tuggle, the workers on unit assembly were not only released from such inhibitions, but also had before them the incentive provided by a job and finish system. Once standard output had been attained,

they were free to leave off work and spend the remainder of the day in the recreation room.

Finally, in the Biggane & Stewart case, we were told that even before job enlargement workers were performing at 135% of standard performance, under a system of pay incentives (whether bonuses or piece rates, we were not told). In this situation then there appeared to have been no significant lack of motivation, pre-job redesign, whilst in the other cases, cited above, other sources of motivation, such as earnings and job quitting, could be identified, in contrast with those postulated by job redesign theorists.

The third point we should consider in trying to explain the observed increases in productivity is the psychological effect of reduced, or eliminated, balance delay time, and waiting time. We saw from the Thornely & Valentine survey that workers in that situation recognised the reduction of 'starting and finishing in the job.' In other words, uninterrupted production runs were presumably longer. Next, it should be recalled that in the cases on which we have data, cycle times after redesign were always less than four minutes, and operations were repeated at least 100 times daily. Finally, we should recollect the work of Baldamus on traction and repetitive work, the feeling of being pulled along by the job in a steady rhythm. Such traction, Baldamus argued was not present in jobs where there were frequent interruptions or repeated, sudden movements. We may therefore

suggest, combining these pieces of information, that one effect of the transition to individual, or unit assembly, would be an increase in traction, a phenomenon associated, according to Baldamus, with higher production.

Finally, we should consider the role of labour elimination in securing productivity increases. Under category I job redesign, the volume of work to be performed was generally constant, and the process of redesign or despecialisation simply redistributed work loads among the workforce, a process which in itself, yields no economic benefit to management. Such benefits as were obtained derived either from eliminating certain grades of worker, or of raising average workloads following redistribution. In either case the 'enriched' workers must expend more effort if more output is to result. This is not the case, as we have seen, with category II redesign, whose two components have opposite effects on effort expenditure vis-a-vis productivity. The elimination of non-productive time means that more output can be produced in the same time with the same degree of effort, but the corresponding attempt to reduce balance delay and waiting time marks an attempt to raise productivity by an intensification of labour, that is, by an increase in effort expenditure. Whatever combination of these strategies is employed, the net effect is that greater output can be obtained from the

same number of workers, or alternatively, that the same output can be delivered by fewer workers. Here, as with category I redesign, the elimination of labour depends to some degree on the state of the market, and on whether production is stagnant or expanding. The type of labour eliminated is different however in the two cases: under category II, we are dealing solely with production workers, under category I with production and ancillary workers, and even if work volume is rising, certain ancillary functions may still be eliminated in category I, e.g. verification clerks in Janson, and the workers transferred elsewhere.

The findings in these various studies might, of course, be interpreted within the framework provided by one of the classical job redesign theories. The work of Hackman et al. specified particular task dimensions, such as variety, autonomy, and task 'wholeness,' whose presence would generate improvements in job performance. Equally, Herzberg's theory might possibly explain some of the findings reported. Whatever the merits of these theories, both are inadequate in the face of two salient features of the cases reviewed. Firstly, neither could cope with the direct effects of flow line restructuring on such items as balance-delay time, or non-productive time. Secondly, neither could accomodate satisfactorily the operation, and the effects, of pay rises and incentives.

In conclusion then we could argue that job redesign of type II increases work cycle time, and work traction, reduces non-productive time and enables workers on pay incentives to control their work pace and volume, and to raise their output more effectively than can be done on progressive flow lines.

Quality improvements

The cases which we have considered under category II have sometimes required workers to assume a degree of responsibility for the products or services in whose production they are engaged. This responsibility has either taken a 'formal' character, with workers carrying out no tests as such, but only being held accountable for the results of the tests carried out by other personnel. Alternatively, simple quality testing previously performed by one or more members of a flow line work team has been assigned to all individuals. On the other hand, there are cases where workers have not been granted even formal responsibility for product quality, or for quality testing. In terms of Hackman & Lawler's dimensions, the latter type of case should result in a much lower score on the job dimension of feedback, as well as slightly reducing the skill variety score, and we would therefore predict a lower

degree of quality improvement in such cases. Equally, Herzberg has argued that holding employees accountable for their work is essential to enable employees to experience responsibility and a sense of achievement, as well as recognition.

TABLE 14 Median %age reduction in errors/defects after reorganisation of flow lines 1

		N	
Where workers responsible for quality testing	75.0%	8	U = 9, ns
Where workers not responsible for quality testing	50.0%	4	

The difference predicted by Hackman and Herzberg is not borne out by these figures, but more striking than the (non-significant) 25% difference in product quality is the 50% improvement found even in the absence of worker responsibility for testing. How then are we to explain this improvement? Sirota has clearly specified the advantages of individual working, in this respect:

> "First, management found it was much easier to identify the source of quality problems when they occurred because they knew which employee had built which mechanism. It is interesting that while job enrichment is often seen as an aspect of 'soft' management, the fact is that traditional 'hard' management practitioners have so designed work that it is often impossible to find out who did what, and who is responsible for what. In other words, the extreme fragmentation of jobs has served to violate basic and sound management principles regarding responsibility and accountability." 2

Similar points regarding the greater ease of assigning responsibility have also been made by Guest, and Biggane & Stewart, and indeed, worker accountability was accentuated in the latter case by means of a personal stamp, used to mark finished products.

Scientific management and reorganisation of flow lines

Certain French writers, as we saw in Chapter 5, have attempted to characterise the practice of job redesign as a form of neo-Taylorism, a blanket conclusion which completely overlooks the very important differences in the forms of job redesign. The present category, of reorganisation of flow lines, is the only one of our three categories which could merit the description of neo-Taylorism. The use of the prefix 'neo-' is, of course, intended to denote that in some way the current practice of job redesign differs from the classical principles and practice of scientific management, but I would like to suggest that category II redesign differs in no fundamental respect from any of these principles, and is in fact an example of the most thorough and consistent application of Taylorism. This can be seen most clearly in the individualism inherent in category II redesign: work teams were often broken up (sometimes this was a cause of dissatisfaction among the workers) into individual units, and inter-dependencies were reduced or eliminated as much as possible. This individualisation

of the production process simultaneously increased managerial control over labour by increasing the 'visibility' of the worker and his products, and allowing the exercise of very precise accountability. Typically, redesign of this kind has been associated with the use of individual incentives (in four cases, and a group incentive in a fifth, flat rate payments were known to have been used in two cases), again a practice strongly recommended by Taylor. Fourthly, the use of method study to eliminate non-productive and unoccupied time was wholly characteristic of Taylor's desire to improve the efficiency of work methods, and to maximise effective working time within the working day. Several components of Taylorism can therefore be seen at work in category II redesign.

In two respects however category II redesign may be thought to have violated Taylorist principles: firstly, on the grounds that whereas Taylor sought to advance specialisation of labour, job redesign seeks precisely the opposite, namely to despecialise. And secondly, whereas Taylor sought to separate production and non-production labour, this category of job redesign, in some cases, unites them. On the question of specialisation it has already been established, first of all that Taylor regarded it as a <u>means</u> for achieving other objectives, in particular maximum intensity of labour. That this was the case was indicated by the fact that Taylor acknowledged there may

sometimes be justification for 'job enlargement,' notably where this was the only means in which a full day's work could be assigned. But secondly, it was pointed out that whilst Taylorism may have appeared as specialisation of labour from the standpoint of the skilled worker, it assumed an altogether different appearance when looked at from the perspective of the semi- or un-skilled worker, typically the focus of category II redesign. In a number of cases reported by Taylor such workers performed the duties previously carried out by their skilled co-workers, and to that extent experienced a measure of job redesign.

On the question of quality control and inspection, in no case has the worker been assigned final responsibility for product quality, and, as we have seen, workers have been held accountable for their work. There are, of course, cases which violate the principle of separating conception and execution, where for instance, workers may be assigned formal, and final responsibility for their work. Such cases have been reported by Janson, and by Guest, but precisely because they have involved reorganisation of both production and ancillary labour, we would regard them as admixtures of job redesign types I and II, rather than deviant, and pure forms of type II.

Summary of conclusions on Category II reorganisation of flow lines

(a) A significant proportion of the improvement in productivity under this category could be

explained by the substitution of productive for non-productive time, as a result of flow line reduction or elimination.

(b) Increases in productivity over and above these levels were attributed to the operation of pay incentives, such that workers, particularly on individual roles, could better control their output, and hence their earnings. In addition, there may well have been increases in productivity derived from labour elimination and raised workloads, although this was less clear.

(c) Quality improvements were attributed to the greater case of accountability by management and supervision.

(d) In a number of cases changes in job attitudes did not appear in the ways predicted by job redesign theories, although performance improvements were invariably found. Once again this reinforces the notion of job attitudes and behaviour as being under the control of separate mechanisms.

(e) This type of job redesign was analysed as a pure form of Taylorism because of its use of individualised work roles; its attempt to increase accountability of labour; its use of pay incentives; and its use of method study to raise productivity.

NOTES AND REFERENCES

1. Case index numbers are as follows: 60, 61, 67-71, 73, 75, 76, 78, 96.

2. Sirota, D. 1973A, p. 13.

3. Case index numbers 59-62, 78-9, 82.

Category II:

Reorganisation of flow lines

Cases with know productivity outcomes

(N = 27)

59. Agersnap, F. et al., op. cit. (Philips Radio)

60. Biggane, J.F. & Stewart, P.A. 1963 (1st case).

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62. Dunn, J. 1974; Wood, W.R. Personal communication, 24/11/76.

63-5. Foulkes, F. 1969 (pp. 120, 146-47).

66. Gallegos, R.C. & Phelan, J.G. 1977.

67. Glaser, E.M. 1976. (Chap. 2, Corning Glass).

68. Harding, D.W. 1931.

69. Janson, R. 1971.

70-1. Kraft, W.P. & Williams, R.L.

72-3. Leigh, A. 1969; Thornely, D.H. & Valentine, G.A. 1968; Donaldson, 1975. Weir, M. 1976A, (Philips case).

74. Sirota, D. & Wolfson, A. 1972, Case 3.

75. Sirota, D. 1973A, Case 2.

76-7. Takezawa, S. 1976.

78-9. Tuggle, G. 1969. Cases 1,2; Tuggle, G. Personal communication. 17/3/77.

80. van Gils, M.R. 1969.

81. Weir, M. 1976A. (IBM).

82-3. Wild, R. 1975 (Cases J,G)

84. Webdill, G. 1976.

194. WRU Report 2, p. 49.

Cases with inadequate, or without, quantitative results

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88-9. Biggane & Stewart, op. cit., Cases 2,3.

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91. Brekelmans, W. & Jonsson, B. 1976.

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94. Ford, R. 1973.

95. Gallegos & Phelan, 1977.

96-7. Guest, R.H. 1957, pp. 11-12, 13-15.

98. Harvey, D. 1973.

99. Lindholm, R. & Norstedt, J.P., op. cit., pp. 82-5.

100. McDavid, op. cit., Case IV

101. Maher, J. In Maher, J. 1971.

102-3. Moors, S.H. 1977, Cases I,II.

104. Novara, F., op. cit.

105. Penzer, W. 1973.

106-7. Pocock, P. 1973. Cases ii, iii.

108. Smith, D.M. 1968

109. van Vliet, A. & Vrenken, L.J. pp. 3-18.

110. van Beek, H.G. 1964.

111. Weir, M. 1976A (General Time).

112. Wild, R. (1975), Case K.

CHAPTER 8 CASES IN THE LITERATURE : FLEXIBLE WORK GROUPS

We come finally to the third category of job redesign, flexible work groups, in which a series of work roles are collapsed, and the duties they entailed, formally assigned to a group of workers. Of course, this does not necessarily imply that specialisation of function is abolished, but it does in fact imply that it is no longer so rigid. Inequalities in workload can be evened out by an appropriate reallocation of group labour, after which workers may then return to their specialised roles. Labour intensification proceeds in this category of redesign through the 2-phase mechanism of flexibility, and the principle by which this operates has been illustrated in Chapter 4, in the discussion of socio-technical theory.

We can compare median productivity increases in cases with varying degrees of labour elimination to ascertain the general significance of this phenomenon:

TABLE 15 Median productivity increases in cases of flexible work groups as a function of labour elimination. 1

		N	
Labour elimination	30.3%	14	
No labour elimination	14.5%	8	U = 26 p<.05 (one-tailed)
Don't know	19.5%	8	

The difference is striking, and statistically significant, and a similar, though much reduced, tendency is evident in the figures for pay rises. However the difference here is not statistically significant, although it should be noticed that a large number of cases, at least 66% have involved the provision of pay rises, either directly, or via the use of incentives, (see Table 2 above).

TABLE 16 Median productivity increases in cases of flexible work groups as a function of pay rises. 2

		N	
Pay rise given	24.0%	21	U = 29.5
No pay rise given	25.0%	3	ns
Don't know	12.0%	6	

Case studies and experiments

Let us therefore examine some cases in detail so that we can then try to analyse the mechanisms at work. We have already discussed the case studies conducted by Trist, Rice et al., within the framework of sociotechnical theory, and will not repeat these descriptions here. It should simply be recalled that the analysis of those cases suggested the importance of pay rises and incentives, and of labour intensification and elimination, in accounting for performance improvements.

Another well-known case is that of the General Pet Foods plant, reported on by Walton, and by Schrank. The General Pet Foods company was about to open a new plant, in a green field site in the U.S.A., at the time of the redesign project (140). Labour for the plant was recruited, and highly selected: of 1200 applicants for the jobs available, only 63 were selected, of whom all were high school graduates.[3] The new plant was technologically superior to existing plant and was expected to increase output substantially. In addition, however, the company decided to opt for a group working scheme. The work of processing had traditionally been divided into the roles of: unloading raw materials, storage, removal from storage, mixing preparatory to processing, and production. Whilst the output end had been divided into the jobs of packaging, warehousing, and shipping. It was decided to amalgamate these work roles into two sets - a processing, and a packaging set, and place each under the jurisdiction of a flexible and autonomous team. The team would allocate labour as required, maintain production standards, and carry out maintenance, cleaning, and quality control duties. According to Walton, the operators much preferred this arrangement, and were less frequently bored compared with their counterparts in the older plant. Indices of satisfaction, such as turnover and absenteeism, were below the industry average, and production averaged over four tons per man per day, compared with 4 ton per man per day in the old plant.

much of this improvement was due to the more advanced technology, but not all. According to orthodox industrial engineering, based on precise allocation of function, 110 men were required for the Topeka plant. In fact, it was eventually staffed by 72, a reduction attributed by Walton to 'team work, and the elimination of indirect labour.'

In a study of a textile plant(123), Janson reported that the company was experiencing problems of inappropriate incentives, over-specialisation, and lack of overall goal commitment. The seven job grades were subsequently collapsed into four, with a utility worker taking over three, formerly separate, functions, and all workers being charged with responsibility for another function. All workers were paid on a group incentive, whereas formerly only the weavers had received any incentive, other workers being in receipt of flat rates. The team also elected its own 'leader,' and met once weekly to discuss production problems. As a result of these changes, loom efficiency (actual output as a %age of theoretically possible output) rose by 5%, and poor quality material fell from 3% of total production to 0.2%. The results were taken as confirmation of 'the five principles of job design' adumbrated by Janson: variety, task identity, client relationships, feedback, and vertical loading.

Another case study(114), conducted in an aluminium casting plant in the U.S.A., was instigated on a much more articulated theoretical basis - a mixture of Herzbergian and socio-technical theory. Under the old organisation of

work, there were three groups of jobs: metal casting, furnaceman, and metal pouring; saw and shear operating, and truck driving and inspection.

> "The main change in organisation was to form the jobs into a team; it involved the men's rotating and learning each other's jobs. The men would train each other on the jobs during regular working hours and would be paid an increment when they passed a theoretical and a practical test for each new occupation. This rotational system would allow the men to change jobs as decided among themselves in order to meet production needs as decided in the team." 4

The changes were instigated in order to try and cope with violent fluctuations in workloads which necessitated equally 'violent' changes in manning levels, a procedure made difficult by the insistence of the men on higher payment for any extra duties undertaken. Over the duration of the experiment, a period of 13 months, productivity rose by 12%, 7% of which was attributed to the changes described.

Questions arising from the cases : the role of labour elimination

As in the cases of vertical role integration two questions arise here: firstly, if labour elimination is crucial in securing productivity increases, what factors are responsible for such increases in the absence of labour elimination? And secondly, is labour elimination a mechanism responsible for raising productivity, or a consequence of a productivity increase, which is itself due to other factors? There is, of course, a danger here in assuming the efficacy of labour

elimination and directing one's attention to explaining away awkward results. But the saliency of labour elimination has been shown already, both generally, across 30 cases in this category, as well as in the more detailed accounts provided in this chapter, and in chapter four. Theoretically the notion that labour elimination can raise labour productivity does make sense, and the questions being asked are of the form 'Are there problems with this explanation, and if so, what are they?'

There are eight cases in which labour was not eliminated, and for which we also have data on productivity. In one of them, the data was invalid since it measured sales performance, an index which could have changed for a variety of reasons, such as different pricing policies, sales concentration on more expensive items etc.[121] In a second case, so many other changes were introduced simultaneously, and the results were taken after such a long interval of time, that the results cannot be taken at face validity. This then leaves us with six cases, reported by Emery & Thorsrud,[117,18], Trist et al.,[136] Archer,[114] Lindholm & Norstedt,[126] and Rice,[131] whose median productivity increase was 12.0% and four of which have already been discussed, in Chapter 4. In the first of these, the study at Christiania Spigerverk, the work of wire-drawing was conducted at separate benches by individual workers, each of whom was responsible for loading the drawer, monitoring its progress, and rectifying any defects. It was proposed that a group of workers should

take responsibility for a group of machines, and that labour should be eliminated. But why was labour elimination so vital in this case? The reasons were twofold, one social, the other technical. Socially, the strategy proposed by the authors involved only the first phase of what must, if it is to be effective, be a two-phase process. In other words, it sought to iron out inequalities in workloads, but it could only raise the average workload by eliminating labour. The reason why this was so brings us to the technical necessity for labour elimination. In certain cases of category III redesign, the production system may be working well below capacity, and be prevented from achieving capacity only, or largely, because of the inefficient distribution of workloads. Once this problem has been remedied (the first phase referred to above), production may increase under the impact of other forces and incentives. In the present case, of Christiania Spigerverk, it is clear that the situation was different, in that the production system was working near to capacity and machine downtime was fairly low. Thus whatever the incentives in operation, the system was working, in a technical sense, close to its limits, and the Emery & Thorsrud analysis amounted, in effect, to the assertion that the department was overmanned.

The study at Volvo (the Torslanda plant) was similar to the wire drawing case, insofar as the press shop was

largely automated, and operator interventions were relatively few. Their role, in other words, was to monitor the machinery and carry out minor repairs. In both cases, Volvo and Christiania Spigerverk, labour productivity was not increased as a result of job redesign.[5]

In the Trist, and Rice studies, in the Durham coal mines and Indian textile mills respectively we find a different situation to the one described above. Although both production systems were highly mechanised, the role of labour was far more significant than in our two previous cases, for different reasons. In coal mining, only part of the cycle of coal getting was mechanised, and several aspects, such as filling, and stonework were labour intensive. In textiles, production runs could be as short as 20 minutes, after which the machinery would have to be emptied, and reloaded with yarn. Since each weaver was responsible for between 20 and 48 looms, there were clearly times when looms would be standing idle awaiting reloading. In both cases uneven distribution of workloads between different jobs restricted the performance of the technical system, as we have argued in Chapter 4, when discussing sociotechnical theory. In both cases, a theoretical averaging of workloads was followed by the raising of this average all round, the latter process being predicated upon the extension of pay incentives to all workers (in the Rice study) or to all jobs (in the Trist study).

In these cases labour productivity could be raised <u>without</u> labour elimination because workers could influence production levels, and because the technical systems were

operating some way below their capacity.

The study (by Emery & Thorsrud) of the NØBO Fabrication Dept., has also been discussed, in Chapter 4, and we will only repeat here the conclusion drawn there:

> "Given the lack of 'variations,' and, apparently, of line-balancing problems, it (the study - JK) does not in fact show the inadequacy of one man: one job, and the superiority of group working. The problem was to break through a social, worker-imposed barrier, not a technical, or organisational barrier,..... and several studies have shown that a variety of techniques, productivity bargaining for instance, has been used successfully to raise output under such conditions."

Finally, we come to the study by Archer, of the aluminium casting plant, described above. There is a problem in discussing this case since it is unclear (a) whether labour was eliminated from the casting department, and (b) whether, if it was, this was included in the assessment of the productivity increase. In addition, the description of the production process was inadequate to allow an assessment of the relative contributions of machinery and labour to productivity. Nevertheless, since it <u>appears</u> that labour was not eliminated, the small productivity increase, 7%, is not surprising, and is compatible with conclusions drawn from the studies we have just reviewed.

These few studies then, suggest that productivity may be increased in the absence of labour elimination where a production system is working some degree below capacity, and where operator interventions can raise productivity. On the other hand, where a system is working close to capacity, and where operator interventions cannot affect

productivity, increased flexibility of labour per se cannot be expected to raise productivity without labour elimination. It follows therefore that for production systems operating close to their technical limit and where operator interventions cannot raise productivity, the elimination of labour is a major factor in securing higher productivity. Schematically, we could suggest that, from the standpoint of productivity, the intensification of labour necessitates the elimination of labour. On the other hand, in production systems operating below capacity and where productivity can be increased by operator interventions, increased flexibility of labour, in conjunction with other incentives, may themselves raise productivity, and thus permit the elimination of labour.

The role of pay rises and incentives

In discussing these other incentives, it was suggested that pay rises, or the introduction of financial incentives, had been undervalued in the sociotechnical case studies. In twelve cases for which we have information, pay incentives were introduced in two, whilst the remainder showed a transition from individual to group-based incentives, in line with the introduction of flexible work groups.[6] We also saw that median productivity increases were no higher in cases with pay rises (N = 21) as compared to those without (N = 3) - 24.0% as compared to 25.0% and that the difference here was not statistically significant, a finding which I am unable to

explain. The question we should then ask is how were productivity rises obtained in these latter three cases.

The study by Locke et al., [127] involved job redesign of types I and III and has been described in Chapter 6. In the type III redesign, the employees were divided into teams and allowed to plan and allocate the various operations under their jurisdiction, as well as carrying out duties previously performed by a higher grade of labour (mail classification). The productivity of the control group rose by 17%, but that of the experimental group increased by 42%. How far was this attributable to improved job content, and attitudes to work? Although the data on attitudes were not separated for different groups in the study, there was almost certainly no significant change in job attitudes. Both this effect, and the large productivity improvements, were attributed by the authors to anticipated pay rises, and to increased intensity of labour arising out of flexibility.

The second and third cases were reported by Rush, and were conducted in the U.S. Internal Revenue Service [133-4]. Work motivation scores and group production rates were as follows:

TABLE 17 Results of the study by Rush (1971)

	E_1	C_1	E_2	C_2
Group production rates				
Pre-experimental	1.53	1.25	1.00	1.42
Post-experimental	1.60	0.85	0.54	0.85
Work motivation scores				
Pre-experimental	3. 7	3. 7	3. 4	3. 7
Post-experimental	3. 8	3. 4	3. 6	3. 4
Group error rates				
1st half of experiment	.34	.87	.89	.78
2nd half of experiment	.44	.90	.76	.72

E - Experimental group

C - Control group

Unfortunately no information was provided on the content of the work motivation survey, which makes discussion of its significance somewhat difficult. Nevertheless it can be seen that for group I there was a correlation between work motivation and production, but not for group II. In the latter case production fell for experimental and control groups, whilst work motivation rose in the former group, and

fall only in the latter. If we compare motivation and work quality, i.e. error rates, it is also clear from the table that these phenomena can move in unrelated directions. There may well be individual differences within these groups, such that work motivation scores, for some employees, did relate to performance, but at the group level this was not so clearly the case. Rush attributed the confusing results to a variety of factors - inadequate changes in job content, insufficient attention to hygiene factors, and lack of interest on the part of the, mostly female, workforce in job content - but the information provided in the study simply does not allow any adequate explanation of the findings.

Thus in the few cases without pay rises or incentives, inconsistent results have been obtained: performance improved among some groups, but not others, whilst attitudes changed in some, but not all, cases.

Finally, let us consider, for individual cases, the evidence relating to theories of job redesign. According to the work of Herzberg, Hackman et al., and the socio-technical theorists, changes in job content should improve worker motivation and in turn lead to improved performance and job attitudes, or satisfaction. The studies by Locke et al., and by Rush, have already been discussed (above), and it was clear that in those cases there was no clear relation between work performance on the one hand, and job satisfaction or motivation on the other. Equally, during the first phase of the Christiania Spigerverk wire-drawing study, the attitudes

of five group members changed from scepticism to being 'positive,' and satisfaction was expressed with the faster passage of time and increased social contact. Productivity, nevertheless, did not increase. In the study at the Aluminium Casting Plant by Archer, the Herzbergian J.R.S. was administered to workers both before and after a series of job changes, but statistical analysis revealed no significant difference between pre- and post-change scores. Again, despite this fact, the majority of workers were in favour of continuing the scheme, and productivity did increase by 7%. In a study by Kuriloff, which involved a large number of changes over a period of time, including changes in pay levels, participation, and job content, productivity rose by 35% whilst 'worker attitudes to the job' remained unchanged. And finally, in a study in the Netherlands, a group of clerical workers was formed into an 'autonomous group' and allowed to distribute several clerical functions amongst themselves as they wished. Whilst productivity rose by 14% job satisfaction increased only slightly (unfortunately we do not have information on the way satisfaction was measured). More generally we can also examine productivity improvements in a range of cases as a function of the number of Hackman-type job dimensions that were altered, viz. autonomy, task identity, variety, responsibility for quality, feedback, and participation in decision-making. The coding of case studies in this category was performed long before any alternative hypotheses were thought of, and it is therefore unlikely that the coding has been retrospectively

influenced by a desire to refute certain other hypotheses. And the coding of each individual case study proceeded in such a way that the job dimensions were noted before the results, thus again helping to eliminate bias. Of course the information in the studies may be incomplete, and in addition, it is difficult to assess, from the studies, to what degree any particular dimension has been affected. Bearing these problems in mind we can look at the figures:

TABLE 18 Median productivity increases in cases of flexible work groups as a function of number of job dimensions altered. 7

Job dimensions altered		N	
2 - 3	22.0%	18	U = 71
4 - 5	28.0%	10	ns

It would seem that a job redesign hypothesis of the Hackman et al., Herzberg or sociotechnical theory type could not be supported by these figures.

There are, of course, studies in which job satisfaction and job perceptions changed in the directions predicted by job redesign theories, as for example, in the cases of NØBO and Norsk Hydro, reported by Emery & Thorsrud, and the case at Philips, described by van Vliet[138]. In all of these

cases employee output per man-hour and/or product quality improved simultaneously, but the fact that attitudes and behaviours have been shown to change independently of each other, indicates that attitude change is not an inevitable, or a necessary component in successful (economically speaking) job redesign. And it further reinforces the view that there may be separate mechanisms implicated in changing these two items.

Quality improvements

In discussing quality improvements in reorganisation of flow lines it was observed that the difference, in outcome, between cases where workers were assigned responsibility for quality and those where they were not, was less significant than the fact that substantial improvements in quality were found even in the latter type of case. To what extent can the theories of job redesign account for variations within this third category of job redesign? If we divide those cases for which quality data is available into those involving major and minor changes in job content, we can then compare the quality improvements in the two sets of cases. The procedure for making this division is the same as that used above in relation to productivity increases.

TABLE 19 Median quality improvements as a function of number of job dimensions altered 8

Job dimensions altered		N	
2 - 3	40.0%	8	U = 19 ns.
4 - 5	31.3%	5	

There are, of course, problems in interpreting data of this sort - for instance, we would need to know about the differences, if any, in quality standards between companies, and about the accuracy with which quality levels were assessed. Equally, we would need to consider, in any particular case, not only the actual degree of improvement, but also the degree of improvement that was possible. Nevertheless the data are suggestive, and indicate that job content changes do not appear to have a significant effect on quality improvements. Unlike flow line reorganisation, where worker visibility and accountability was increased, it is possible that the opposite process occurs in category III redesign since one man:one job allocations are replaced by a more diffuse assignment of responsibility to the group as a whole. Nevertheless substantial improvements in quality were obtained in both categories.

There is again insufficient information on the majority of these cases of flexible work groups to enable any reasonable

appreciation of the factors which might be operating, but we do know that in four cases, wage incentives were extended so as to make them dependent on product quality as well as quantity.[9] Three of these cases involved textile plants, where product quality is a variable subject to a large number of influences. Operator responsibility for quality was thus initiated, or perhaps extended, via the mechanism of financial incentives. The fourth case was at the Hunsfos paper processing plant in Norway, which was operated on a continuous basis. The effects of operator interventions were thus chiefly concerned with controlling variations in product quality, although interruptions in processing could also be influenced to some degree by the operators. The paid bonus however reflected only the latter degree of influence, and with its experimental extension to several indices of product quality, these same indices showed dramatic improvements.

Scientific management and flexible work groups

The principles and practices of scientific management were developed under industrial conditions in which advance planning and allocation of work was possible, and where large and irregular variations in work volume, were infrequent. These industries included the jobs of labouring, machining, and bricklaying, all of which allowed considerable operator control over production volume. If however we compare the industries

which have employed flow line reorganisation (analysed as a contemporary application of Taylorism) as opposed to flexible work groups, we can discern a striking difference:

TABLE 20 Incidence of job redesign techniques, by industry groups. 10

Industry groups	Category II	Category III
Electrical engineering	27	7
Insurance et al.	9	5
Vehicles	2	5
Transport/communications	3	2
Clothing/footwear	2	1
Metal manufacture	0	2
Mining	0	3
Textiles	0	7
Chemicals	0	9
Furniture	0	1
Retail	0	1
Food	0	5
Glass	1	1
Paper etc.	0	1
Mechanical engineering	1	4
Instrument engineering	0	0
Other	5	4
Don't know	4	7
	54	65

The use of category II redesign has been concentrated in a relatively small number of industries (or groups of industries): electrical engineering alone accounts for just 50% of the cases. Within this industry group, job redesign has been further concentrated in assembly, or final assembly departments, that is, in situations where work volume is fairly predictable, and where, on non-powered conveyor lines, it is subject to operator control. The industrial dispersion of category III redesign

appears at first sight much greater since no particular industry group dominates the figures. But the type of industry groups in which it has been used is quite different: metal manufacture, mining, textiles, chemicals, food, glass and paper comprise 42% of the total number of cases. These industries are highly capitalised, unlike the more labour intensive electrical engineering industry. In many of them production takes place on a continuous, or semi-continuous process basis, in which the role of the operator is rather different from that of his counterpart in product assembly. Work in the former industries more frequently involves machine monitoring, and attempts to reduce machine downtime, with the overall pace of production under a much smaller degree of operator control as compared to product assembly.

The work conditions are therefore rather different in many of these cases from those which furnished Taylor with the basis of his theory of scientific management. These differences - in machine control, process variability, and operator functions - require rather different techniques in order to achieve the Taylorian goals. Precise allocation of duties, and of workloads is rendered difficult by irregular variations in production volume, quality, machine functioning etc. Thus on certain occasions operators may be overworked, on others underworked. As we have argued elsewhere (Chapter 4) the significance of socio-technical theory and of type III redesign, to which it gives rise is that it has, if only implicitly, discerned the limiting conditions beyond which precise allocation of work on an individual basis becomes

increasingly difficult. Hence the recommendation that work groups take responsibility for a series of duties. Of course, there will be variations in workload even at the group level, but it can be shown mathematically that these will constitute a smaller proportion of total man-hours, than would be the case were duties allocated individually. In general then, we may suggest, at this stage that category III redesign has abandoned certain features of scientific management - individual allocation of work, accountability, and payment - but has done so to the extent that it has encountered limiting industrial conditions beyond which scientific management principles become less effective in achieving their stated goals.

There are, however, two immediate objections which may be raised against this argument: firstly, it could be pointed out that socio-technical theorists have recognised the limits of applicability of their own work, but have conceptualised this in terms of large task size, rather than product/process variability; secondly, it could also be pointed out that the brief discussion (above) of industrial variability and category III redesign referred only to 42% of the cases listed - what about the other 58%?

Both Engelstad, and Emery & Thorsrud have argued that 'job enlargement' (approximately equivalent to category II redesign) may be used successfully (to improve productivity, quality, worker attitudes etc.) where the average size of

tasks is such that they can be carried out by individuals. Presumably, therefore, they have in mind the assembly of small products, for instance, where a 'whole' job may be carried out by a single worker. In capitalised, process industries, on the other hand, group working may be more effective since 'whole' jobs are so large as to be beyond the capacity of individuals, and frequently transcend shift boundaries, as in coal mining for instance.

It is difficult to effect a direct confrontation between these two ideas - variability and task size - for appreciating the sphere of effectiveness of category III redesign, since, to some degree the two features empirically coincide. Product or process variability tends to be associated with continuous or semi-continuous process industries, such as chemicals, where 'whole' jobs tend to be difficult to accomodate within the orbit of an individual. And conversely, where 'whole' jobs are possible for individuals, this tends to be in more labour intensive, and routine, processes such as assembly.

Nevertheless, it has been shown why flexible work groups are theoretically necessary under these conditions, and the way in which their functioning can explain changes in productivity size. Merely to observe that group working is required in order to span a large task does not explain why, or how, it is able to increase productivity.

On the second objection, it is true that many of the category III redesign cases were conducted in situations where there <u>may</u> not have been considerable variations in production,

and hence inequalities in workloads, such as furniture manufacture, vehicles, insurance, and electrical engineering. However, there is often insufficient data to make a judgement on this issue. In other cases it is possible to suggest that flexibility of labour was not a major factor in raising productivity. For instance, in the study by Bryan of the Cummins Engine Company, productivity of labour on a new production line was raised 'theoretically' by collapsing several jobs into individual roles, and thereby reducing total labour requirements. In addition, labour was flexible between jobs, but the major increase in output per man hour had already been achieved. In the study at NØBO, reported by Emery & Thorsrud, it has already been observed that output was only raised when the workforce were induced to cease restriction of output. The productivity rise in this case, again, was not predicated chiefly on labour flexibility. In the Philips study, reported by van Vliet, method study was used to reduce unit production time, but over and above this productivity rose only a few per cent.

To sum up then, we may simply re-iterate the conclusions reached earlier, in Chapter 4. Insofar as category III redesign may be seen as a new 'best way' of organising work under conditions of product and/or process uncertainty, it may be said to have preserved the form, though not the content, of Taylor's 'one best way.' At the same time one should also notice the predominance of pay incentives and pay rises in this category of job redesign. Nevertheless the emphasis

on group working and on flexible work assignments serve to differentiate this form of redesign from classical scientific management.

Summary of conclusions

(a) The elimination of labour was said to be crucial in raising labour productivity where workers had little impact on the production system, and where the system was operating close to its technical capacity. Productivity increases resulted from a two-phase process in which, firstly, workloads were theoretically averaged, and secondly, after elimination of labour, they were generally raised.

(b) Although the second phase was not always found, productivity could still be raised through the use of pay rises and incentives in production systems where workers' efforts could increase output, and where the systems were functioning some way below capacity.

(c) Both the sociotechnical and the task design theories were said to be inadequate in interpreting variations in productivity increase either within, or between, cases.

(d) Once again cases were found in which job performance increased, whilst attitudes were unchanged, and in which attitudes improved whilst

job performance worsened. These cases were said to support the dual-mechanism theory of job attitudes and performance advanced earlier.

(e) Data on quality improvements was not available in many cases, and was difficult to interpret, but it was noted that in at least four cases, bonuses or incentives were introduced for quality improvements.

(f) Category III redesign was analysed as a form of job redesign which had implicitly discovered the limiting conditions - product and/or process uncertainty - beyond which certain Taylorist principles, e.g. individualisation of work roles, enhanced individual accountability, ceased to be the most effective (economically) form of work organisation.

NOTES AND REFERENCES

1. Case index numbers 113-42.

2. Case index numbers 113-42.

3. See also the comments by Fein, in Chapter 5, above, on this point.

4. Archer, J.T. 1975, p. 259.

5. Productivity did increase in the second phase of the Christiania Spigerverk study, when labour was eliminated. See Chapter 4 above.

6. Case index numbers 114, 117, 118, 123, 125, 131-2, 136-7, 140, 166, 176.

7. N = 28 here as two case studies were obtained too late for inclusion in this analysis. Case index numbers are: 113-127, 129-134, 136-142.

8. Case index numbers 123-4, 130-4, 136, 138, 140, 144, 148, 151.

9. Case index numbers 123, 131, 132, 151.

10. The industry groups are some of those used in the Dept. of Employment's Standard Industrial Classification.

Category III : Flexible work groups

Cases with known productivity outcomes

(N = 30)

113. Andreatta, A.J. 1974; Welvic II Report (excerpt). n.d.

114. Archer, J.T. 1975.

115. Bryan, E.J. 1975, pp. 326-29.

116. Davis, L.E. & Werling, R. 1960.

117-19. Emery, F.E. & Thorsrud, E. 1974. Christiania Spigerverk, NØBO, Norsk Hydro.

120. Hallam, P.A. 1976.

121. Hepworth, A. & Osbaldeston, M. 1975A.

122. Hill, P. 1971, pp. 162-63.

123. Janson, R. 1974.

124. Kuriloff, A.H. 1963; Kuriloff, A.H. Personal communication 25/3/77.

125. Lindestad, H. & Kvist, A. 1975.

126. Lindholm, R. & Norstedt, J.P. 1975, pp. 27-9

127. Locke, E. et al., 1976, Group A

128. Moors, S.H., 1977, Case III.

129. Anon. Experiments to improve the quality of working life in the Netherlands. 1975. (Post Office).

130. Prestat, C. 1972.

131-2. Rice, A.K. 1953; 1958, 1963.

133-4. Rush, H. 1971 (Internal Rev. Service).

135. Taylor, J.C. 1977, Case B.

136-7. Trist, E.L. et al. 1963.

138. van Vliet, A. & Vroaken, L.J., op. cit., 2nd expt.

139. Waldman, P. et al., 1976.

140. Walton, R.E. 1972; Jenkins, D. 1974; Walton, R.E. 1974, 1975, 1977.

141-2. WRU Report 2, op. cit., pp. 72, 95.

Cases with inadequate, or without, quantitative results

143-4. Agersnap, F. et al., op. cit., Hødjberg cases.

145. Anon. Job enrichment at Bamshoeve. 1975.

146. Anon. 50% reduction in labour turnover for Courtenay Wines. 1974.

147. Anon. Work teams at Pye beat production line problems. 1972.

148. Armstrong, J. 1977.

149. Birchall, D. & Wild, R. 1974, Case 1.

150. Daniel, W.W. 1970. Case A.

151. Engelstad, P. 1972; Emery, F.E. & Thorsrud, E. (1975) Chapter IV.

152. Frank, L. & Hackman, J.R. 1975.

153. Anon. Job enrichment at Hoogovens. 1975.

154. Jenkins, D. op. cit., Chapter 12, Procter & Gamble.

155. Kenton, L. 1973, (British Fermentation Products).

156. Lindholm R. 1973 , (Case 1, Gullhögen).

157. Lindholm, R. & Norstedt, J.P. op. cit., pp. 81-2.

158. Anon. Can group assembly boost output at Lotus? 1975.

159. Mills, T. 1976; Trist, E. et al., 1977.

160. Mukherjee, P. 1975.

161. Nichols, T. 1975.

162. Noren, A. E. & Norstedt, J.P. 1975, pp. 16-28.

163. Norstedt, J.P. & Aguren, S. 1974.

164. Pocock, P. op. cit., Case i.

165. Roeber, J. 1975. Chaps. 10-14; Roberts, C. & Wedderburn, D. 1974.

166-7. Taylor, J.C. 1977A, Cases A,C.

168-71. Taylor L.K. 1973. (Shell, W. Tatton, Watford Launderers, Hill of Fife).

172-3. Terisse, H. 1975.

174. Torner, P. 1976.

175. Anon. Job enrichment at United Biscuits. 1974.

176. Waldman, P. 1974.

177. Weir, M. op. cit., 1976A, Case X.

Mixed categories

Cases with known productivity outcomes

178. Birchall, D. & Wild, R. (1974), 3rd case.

179. Dyson, B. 1973; Hartel, B. Personal communication 28/3/77.

180. Ford, R., 1969. (Framemen), Appendix B.

181. Hepworth, A. & Osbaldeston, M. 1975B.

182. Hackman, J.R. et al. 1975; Janson, R., 1975.

Cases with inadequate, or without, quantitative results.

183. Aguren, S. et al. 1976.

184. Birchall, D. & Wild, R. (1974), Case 2.

185-7 den Hertog, F. 1974. pp. 18-20, 20-25, 27-30.

188. Foulkes, F. op. cit., pp. 120-21.

189. Guest, R.H. op. cit., pp. 12-13.

190. Novara, F. op. cit.

191. Pocock, P. op. cit., Case iv.

192. Sirota, D. 1973B, Case C

193. Sirota, D. & Wolfson, A. 1972, Case 4.

CHAPTER 9 CASE STUDIES IN JOB REDESIGN

Introduction to the case studies

The examination of a large number of cases, in the form of a literature review, can suggest hypotheses and mechanisms, which must then be explored in detail in individual cases. Conversly, the individual case may illustrate the operation of certain mechanisms, but to discover the generality of their operation we must examine a wide range of cases. The two approaches - the literature review and the case study approach - are therefore both necessary and complementary, although both of them have problems.

The case study method is limited to the extent that the applicability of any findings is unknown, because of doubts about the representativeness of the particular case in question. One may find for instance that changes in payment and control systems adequately account for changes in job performance in a particular instance of job redesign. But all this would show is that such factors *can* explain job redesign outcomes: it would not show that they *do* in fact explain these outcomes, generally speaking. And until one has tested such an account in a large number of cases there remains the possibility that the in-depth cases are

in some way special, or deviant. The aim of this chapter cannot then be to show that the theory of job redesign offered in this thesis does explain job redesign outcomes: it can only have the more limited aim of showing that, in a number of cases, this theory could explain the events of interest.

Ideally, a case study in job redesign would allow one to compare the classical and the present theories of job redesign in terms of the four central, classical, propositions. In other words, one would be able to conduct a before - and - after study, using control groups, and to partial out the effects of changes in job content, payment, control, methods changes and labour elimination, either empirically, by creating different experimental conditions, or analytically, by means of statistical techniques. For reasons advanced in Chapter One, this ideal was impossible to attain, and none of the three cases in this Chapter approximates very closely to it. In no case was it possible to obtain before - and - after data, as all of the changes had been introduced prior to my arrival, or, in one case, had not been introduced at the time of my departure. In none of the cases was it possible to obtain attitudinal data, and only one of the cases employed something resembling a control group whose performance was to be monitored. In addition to these deficiencies must be added the author's own biasses. At the time when the data reported here was in the process of collection, I had not yet developed the theory of job

redesign as presented in this thesis, although elements of it were clearly beginning to form, and take shape. It must be borne in mind therefore that my own predilections may have biassed (in some way) the collection of data in these cases, and thus resulted in misleading accounts.

Faced with these deficiencies it would be tempting to dismiss the cases as being worthless, but needless to say I would not consider this to be a justifiable or a wise course of action. The material in these cases is short of ideal (in some cases by a long way), but it is still of interest because of its novelty. This applies particularly to the Meccano case, where there were observed variations in job performance that were independent of job content, but associated with changes in pay systems. In other words the situation was one in which (a) job content was changed, and (b) after a period of time, the pay system was changed. This is not an ideal test of the classical and the current theories of job redesign, but it is certainly a great improvement on cases with simultaneous variations in job content and systems of pay, which are only too common in the literature. The case also illustrates the Taylorist logic inherent in reorganisation of flow lines.

The relation between scientific management and job redesign has been treated in this thesis mainly in historical and theoretical terms, and I have inquired whether changes in job content and their outcomes may be seen as compatible with tenets of scientific management. Part of the argument

that job redesign has 'abandoned' scientific management, rests on the identification of the latter with labour specialisation, which I have shown to be erroneous (Chapter 2). But one can still ask about the relationship between job redesign and specialisation, and ask, in particular, about their alleged incompatibility. By focussing on the attitudes of managers in a job redesign exercise, the United Glass case explores the job redesign - specialisation relationship in a very concrete manner. But more importantly, it also sheds light on a neglected party, and a neglected phase, in the implementation of job redesign. The author attended many meetings, and held many discussions with managers in the United Glass company, and was thus able to collect information on the preparations by the management for an exercise in job redesign.

The remaining case was selected for inclusion, in part, for the same reason: it had been introduced without the formal accompaniment of job redesign theory, seminars on motivation, visits from consultants etc. It was interesting therefore to see how it compared with those based more explicitly on contemporary theories of motivation and to consider its economic bases. Apart from that, the case was of some relevance to one of the four central propositions identified above, regarding the mutual interests of workers and employers. In addition this case is of some relevance to discussions about the future of job redesign. Although none of the cases relates to the third proposition - on job performance, and job attitudes - this was deemed to

have received sufficient attention (empirically) in the previous chapters.

Each of the three cases also fits into the categories of job redesign employed in the previous chapters. The United Glass study is an instance of category I, vertical role integration; the Meccano case, of category II, reorganisation of flow lines; whilst the Dairy case belongs to category III, flexible work groups.

A number of additional case studies and investigations were carried out, and the project at British Rail for instance, has been referred to elsewhere. But these cases are either inadequate, and/or merely duplicate some of the points which emerge from the three main cases.

CASE 1 - MECCANO LTD.

The Study

The data on which this case study is based are derived from three principal sources. Firstly, I have drawn heavily on three of the reports produced by the firm of consultants which recommended, and supervised, the introduction of unit assembly. The first report outlines their analysis of the assembly-line and its deficiencies, and contains a list of recommendations for change. The second report describes the results of the first experimental trial of unit assembly, and the final report evaluates the unit assembly one year after its introduction into a whole shop. Secondly, I have consulted company records for data on performance and pay levels, absenteeism, and certain parameters of production. Thirdly, I conducted interviews with representatives of both management and unions, including three interviews with the Works Manager, and one interview each with the Training Manager, Work Study Officer, Unit Assembly Superintendent, Unit Assembly* Foreman, and the Chief GMWU Shop Steward. In addition I participated in a discussion about UA involving the Works, and Training Managers, and the Work Study Officer, and spent some time observing both the assembly line and UA in operation. Unfortunately it proved impossible to conduct interviews with, or administer questionnaires to, the employees themselves. This means that direct statements about employee attitudes and motivation cannot be made, but we do have data on changes in employee behaviour in response to changes in

* Hereafter abbreviated to UA.

their work situation. Since the principal concern of this thesis has been with explanations of employee behaviour, i.e. job performance, the absence of attitudinal data is not critical, although it does weaken, somewhat, the conclusions drawn from the case. In addition I have also examined a number of independent reports of the Meccano exercise.[1]

The Company and the Plant

In 1971, when the work reorganisation project began, Meccano Ltd. was registered as an independent company, and existed as such, but the same problems which led the management to hire consultants to examine their production processes simultaneously resulted in the Company being taken over by Airfix Ltd. Although the takeover has affected the autonomy of Meccano management, the work reorganisation continued without interference.

The plant itself is situated in an industrial complex which is itself located in a working class suburb of Liverpool. In 1971 the plant employed 1200 workers, but with the onset of the world economic recession, the Company saw its sales fall, and resorted therefore to redundancies and non-recruitment of staff. By 1976 the workforce had fallen below 1000, and no recruitment had taken place for at least twelve months. During this period a certain proportion of the workforce quit their jobs, or were dismissed, thus contributing further (by so-called natural wastage) to the reduction of the labour force.

The company manufactures toy cars at its Liverpool plant, whilst Meccano sets themselves are produced elsewhere. The products are aimed at the upper end of the toy market, and in 1976, a single toy could cost between £2 and £5. The market itself is both competitive and unstable, and the two features are interlinked. Although there are few other

producers of scale model cars etc., selling in the British market, there are numerous companies producing cheaper toys made, for instance, from thermoplastic. Empirically, the company has discovered that during economic recessions, sales of its own products slump as consumers divert their spending to cheaper products. During certain periods therefore the company does compete with manufacturers at the lower(price) end of the market. In addition to this competition and instability enforced by the business cycle, these also exists an instability intimately connected with the product itself. It has been found that sales of a new model are very high during the first months of its life, but fall off rapidly thereafter, eventually stabilising at a much lower level. This phenomenon is, in all probability both cause and effect of the way toys are marketed by the majority of world manufacturers. They are intended to sell over a relatively short period, thereafter to be replaced by a new model, and as sales of the new model rise, those of older models fall. By means of this continuous replacement of models, the manufacturers are able to maintain their sales at a higher level than would otherwise be the case. This continual transformation of the product is a phenomenon which has considerable repercussions on the production process within the plant, as we shall now see.

The production process

The process of producing toy cars comprises, from the standpoint of labour, a series of quite simple processes. The final product typically contains no more than about 10-12 separate pieces, and of these only the major ones are actually produced at the Liverpool plant. The base of the cars is made from an aluminium alloy which, after melting, is run into a mould and rapidly cooled, before being released into a hopper. This process is repeated at (a maximum of) sixteen machines arranged in a row along one side of a rectangular room, with an aisle on the other. The body of the vehicle is made from thermoplastic: tiny pellets are melted down, run into moulds, and released into hoppers, and again each process is repeated on a series of identical machines. These two operations are paid at a higher rate than the final assembly work, and are conducted almost entirely by men.

The remaining parts that go to make up the complete model are manufactured elsewhere, and delivered to the Liverpool plant for final assembly. Before reorganisation the assembly work was divided into major assembly and sub-assembly, and, in addition, there were a number of ancillary operations performed at individual workplaces. The assembly operation before reorganisation, was carried out by two teams, each of 10-12 workers, seated either side of a moving conveyor. Service workers would feed parts e.g. the metal

chassis, onto one end of the conveyor, and each worker in turn would pick it off the moving conveyor, add their piece, and replace the product on the conveyor, whence it would pass to the next worker. In general there were between nine and twelve workers on each side of the belt, and each one would be kept supplied with their particular piece of the model by one of the service workers. Again, as with the individual ancillary operations, cycle times are short, between 5 and 10 seconds on average, with a complete product usually taking just over a minute to be fully assembled.

The ancillary operations consisted for example of punching holes in the metal base of the car using a simple hand press; another operation involved placing 'transfers' onto the body of the car. Each of these ancillary operations was performed by a number of individuals arranged in rows of tables and chairs. At each workplace would be a tray into which parts were placed by a service worker, and a tray into which the parts were dropped after whatever operation had been performed on them. The work does not require the development of any fresh skills, but simply the co-ordination of hands and eyes in order to maintain a high rate of production. The cycle time is often less than five seconds so that the same operation may be repeated as often as 500 - 600 times each hour. Typically, the workers on these jobs are young, unmarried girls, and the rate of pay is lower than most jobs in the factory.

In addition to the workers described hitherto, there were numerous other workers engaged in internal and external

transportation, in storage and loading, maintenance, repair, catering, clerical and administrative work, management and its specialisms, such as finance, sales, personnel, work study, supervision, etc. and in general labouring throughout the plant. When asked about industrial relations in the plant, most of those interviewed claimed that in general they were very good, with the exception of one or two 'black spots.' At the time of this study, and indeed, for the past few years, management had been engaged in negotiations with some of the 'skilled' workmen over grading and regrading, but there seemed no reason to disbelieve their general assertion that industrial relations were generally quite peaceful. The majority of the assembly, and ancillary workers, belonged to the GMWU, whilst the 'skilled' workers, such as the repair and maintenance workers, and the toolroom workers, belonged to the AUEW, engineering section.

The workers with whom this case study will be concerned, namely the assembly workers, were paid according to a mixed time rate and output incentive scheme. All received a basic rate of pay for forty hours (or thirty hours in the case of the 9-3 shift, of whom more later) which amounted in the early 1970s to approximately 67% of earnings for 100% Standard Performance.[2]

Background to the work reorganisation

Unemployment in the Liverpool area, although it remained high throughout the 1960s, was a rather different problem

from the situation today. Production was expanding in the late 1960s and early '70s, and at the lower end of the labour market there were a considerable number of jobs. Demand for Meccano's products was rising, and production was sufficiently profitable to justify expansion, so in the late 1960s, the labour force was swelled by the recruitment of almost one hundred young married women. Because the majority of them had children they were employed for six hours each day, instead of eight, from 9 o'clock until 3 p.m. This expansion of production however, although an inevitable and a necessary response to rising demand, nevertheless served to expose a number of deficiencies in the production process, viewed from the standpoint of distribution in the market.

We have already explained the basis on which the production and distribution of toys is maintained at a high level, that is through rapid model changes. In the late 1960s and '70s, this process was intensified, and the number of new models produced each year increased. This increased turnover of models placed considerable strains on a production system which was designed primarily for medium and long term mass production. Although an assembly line can quite easily cope with small product changes, it does have the drawback that during the changeover all of its workers are idle (unless, of course, they can be employed elsewhere). The increased frequency of new products thus had the effect of increasing the proportion of working time during which the workers were 'idle,' waiting for fresh supplies of parts in order to begin the assembly of a new

product. But there is also a cumulative effect to be considered. As the range of the company's products grew in size, the number of products that could be re-ordered by a wholesaler or retailer grew likewise and once again the effect on the production system was the same. It had to bear an increased number of product changeovers, and hence produced an increased amount of idle time (or waiting time) on the part of the workforce. To some degree these greater demands could be, and indeed were, handled by rationalisation of incoming orders. The Production Manager would hold up orders for a particular product until he had a sufficient number to provide a production run of at least one day's duration or more. But however satisfactory this may have proved as an interim measure, it failed to tackle the root of the problem, which was the production system itself.

There were, of course, a range of alternative solutions open to the company: it might for instance have attempted to standardise its products.[3] Or it might perhaps have tried to reorganise the system of distribution to wholesalers so that they held both a greater volume and a greater range of products in stock. The decision to tackle the organisation of production was taken however, because of a conjuncture of problems and circumstances, as a result of which it appeared at the time that such a decision might help solve several problems simultaneously. Firstly, with the continued expansion of local production throughout the late 1960s, the turnover of labour increased substantially, reaching an annual rate

of 50-60% in one year. Although this turnover was confined to approximately one third of the workforce, the other two-thirds being more long term employees, it nevertheless represented a degree of disruption to assembly line working. Workers who quit did not always give the required notice (usually this was one week) or indeed give any notice at all, and their departure, as well as entailing recruitment and training costs had an effect on production similar to that of absenteeism. The effect of absenteeism, the second problem confronting management, was altogether more serious, for two reasons: firstly, it was, by definition, unpredictable. Although the management knew that it generally experienced a weekly absenteeism rate of 10-15%, it was difficult, if not impossible, to tell with any accuracy which section of the workforce, and hence of the production process, would be affected. But absenteeism was particularly costly where production was so organised that the workers were highly interdependent, as was the case with the assembly line.

The third, and the final, reason predisposing management to examine the organisation of production, was not, as Harvey suggested, that an assembly line necessarily functions at the pace of its slowest member. The effect of the slower operatives depends to a considerable degree on their location within the line: if they are at the start of the assembly process, then the line will function at their pace, whereas if they are placed towards the end of the line their effect on the overall speed will be much reduced. The third reason

for the management's 'decision' derived from the composition of the capital invested in production. The amount of machinery was small compared to the volume of labour employed, and the assembly lines in particular were highly labour intensive. With labour comprising such a high proportion of the costs of production, it was not surprising that management's thoughts turned to labour when it seriously began to consider the necessity for improvements in efficiency. A firm of consultants was therefore invited to study the production system and prepare an initial report outlining possible ways of reducing costs and/or improving efficiency.

The consultants' report

The report, produced in 1971,[4] made two chief proposals: firstly, that assembly line working should be abolished and replaced by individual assembly; and secondly, that the requisite re-assessment of payment schemes, standard performances etc., should be carried out on the basis of MTM 2 analyses of the production process. The results of implementing the proposals would be method improvements, and a reduction in labour and overhead costs per unit of output. As it was anticipated that earnings per operator would rise under the new work scheme, what the consultants were in fact proposing was a significant increase in the productivity of labour. The current assembly lines were seen as being subject to two major problems: it was

difficult to balance out the total workload, so that some operations took longer (or shorter) to perform than others with the result that some of the total labour time went unused. And secondly, because some operators had occasionally to work faster than others, and also because there were times when all the operators had to work fast, there was a tendency for product quality to be rather low. Consequently a not inconsiderable number of workers had to be engaged on checking and adjusting the assembled products as they came off the line. These, and other considerations led the consultants to propose eight criteria which ought to be satisfied by any proposed changes in the organisation of work, and they were as follows:

i. provision of facilities for identification and quantification of methods improvements and for ways of "making these acceptable to labour".

ii. provision of means for more accurate assembly balancing and for reducing the frequency of component handling.

iii provision of simple work data for use in preliminary costing of operations.

iv. simplification of wage calculations.

v. provision of a basis for sound labour cost control which allows supervision to take remedial action.

vi. an increase in the proportion of operations covered by measured standards.

vii. reduction in the effect of lateness and absenteeism by increasing flexibility while minimising the need for standby operatives.

viii. "Give employees a wider responsibility, thus providing JOB ENRICHMENT." (1971, Capitals in original).

Of course not all of these objectives were attained in practice: for instance, the payment system was left substantially unaltered. And indeed some objectives, such as item i., may best be regarded purely as selling points, as there seems no à priori reason why the progressive assembly system could not result in methods improvements. Nevertheless, there is one crucial point to be noticed about these recommendations, and it is one of which we shall have more to say later. The provision of 'Job Enrichment,' ostensibly a restructuring of work to enhance workers' motivation to perform 'well,' was accompanied by a series of other proposals for achieving much the same purpose. The productivity of labour was to be raised in various ways, including for example, the elimination of non-productive work, such as handling and rectification. This seemingly comprehensive strategy was no mere case of 'overkill,' and nor, can it be understood as an integrated approach to the problem of raising productivity. For as we shall see, in practice, although there were undoubtedly elements of job 'enrichment' in the consultants' proposals, the results that were actually

attained owed far more to the traditional methods of labour intensification, methods improvements, and pay increases, than to any changes in 'intrinsic motivation.'

But before turning to examine the recommendations in practice, it is worth dwelling on some of the theoretical assumptions underlying them, for it then will become clearer that the use of the term 'job enrichment,' is to say the least, somewhat ambiguous. One of the chief proposals, as we said, was that the production process should be reorganised with the aid of MTM.2 a technique of work measurement. The whole series of MTM techniques - Methods Time Measurement - differ from more conventional work study in one crucial respect. Whereas in the latter, a particular operation is assessed by first analysing it into its constituent elementary motions and then timing each motion in turn, with MTM one already has a series of elementary motion times ready to hand. For MTM assumes,

> ".....that manual work in industrial conditions can be regarded as consisting of different combinations of a relatively small number of basic motions." 5

and MTM practitioners have therefore spent a considerable amount of time and energy in developing catalogues of the times required to perform these "basic motions." In theory, one can then provide an accurate assessment of the time that would be required for any piece of work, regardless of whether it has ever before been performed. The members of work study departments, again in theory, would thus be relieved of the necessity ever to appear on the shop floor, watch in hand. MTM.2, a development of MTM.1, is a system

in which times are produced and recorded not only for "basic motions" but also for combinations of these motions. Those with some historical perspective on their subject may well wonder where they have heard such ideas before, and if they were to pursue their suspicions to the pages of Frederick Taylor's 'Piece Rate System,' or 'Shop Management,'[6] they would have them confirmed. On pages 177-178 of the latter, Taylor expressed his long felt wish to see the compilation of a book in which the times for all of the elementary motions in a number of trades, would be clearly set out, for use by employers. Now although Taylor recognised that people worked at different rates, he eventually came to deny that variability in working methods was compatible with the demand for efficiency. For this goal to be attained it was essential to combine those elementary motions which together constituted "the one best way" of performing a particular operation.[7] This 'one best way' was to be determined by scientific analysis of elementary motions and by synthesis of "the quickest and the best movements.....". It was then the task of the management to train workers in the 'one best way' of working, and to transfer, or otherwise eliminate, workers who were revealed as other than first-class in this particular 'trade.'

MTM.2, as we have already said, is based on a remarkably similar philosophy. The numerous critiques by psychologists of the idea that there is 'one best way' of working for all workers, and their assertions that patterns

of movements must be allowed to vary in order for efficiency to be achieved - these points have apparently made little impact on the consultants in our present study.[8] Under MTM.2, workers are trained to perform the series of movements which, according to the analysis using MTM.2, are the most efficient and effective for task performance. Any notion of the existence, or value, of individual variation in preferred working methods is excluded, or so it would seem. But we then come to the curious contradiction - for having advocated the use of MTM.2, the consultants also advocated 'job enrichment,' a concept which is generally taken to refer, at the most abstract level, to the maximum development of the individual through his/her work.[9] To achieve this purpose, jobs are redesigned, according to Herzberg for instance, so as to provide the employee with responsibility, a sense of achievement, the chance to learn, and to 'grow,' and with recognition for their efforts. And Hackman et al., argued that job redesign was to involve the delegation of authority, and the enhancement of the employee's freedom and discretion to work at his own pace, using his own methods, ideas which also figure prominently in the work of sociotechnical theorists such as Trist, Emery and Gulowsen.[10]

The use of MTM.2 would seem therefore to conflict with at least one of the prescriptions generally featured in a programme of job redesign, as well as with the principle of individual development. It is of course true that employees in this case study were to be given control over their work

pace, to be assigned more responsibility for product quality, and were to assemble a whole product instead of only part of the product, all of which are prescriptions strongly recommended by job redesign practitioners. We will see however that the use of MTM.2 in a certain way does not merely violate a particular job redesign prescription, i.e. choice of working method, but more importantly, it signifies a profound contradiction in the way job redesign was understood in this context. Having pointed out some of these contradictions in theory, let us look and see how they manifested themselves in practice, and how they were ultimately resolved.

The changeover to unit assembly

Both consultants and management were confident that their scheme would be accepted by the unions and the workforce, not only because it promised more interesting work and relief from the continual grind of the assembly line, but because of the extra pay. The transition to unit assembly (UA), began in late 1971 with a series of observations on an assembly line team. These were done to establish a base line against which changes in work methods and organisation could be assessed, and they included measures of total output, number of hours actually worked, the amount of time spent on rectification and in waiting, and the total payroll for the operation. It was then possible to calculate the total time taken to produce a toy, and the labour cost per toy. This team of workers, in addition to a number of foremen and supervisors was then transferred to a unit assembly area where they were trained for two months on the new operation. Each worker on main assembly now sat at a specially designed work station, which consisted of a work surface and a series of trays, stacked on top of one another, in which were laid out the various pieces to be assembled. The operator sat facing this cluster of trays, assembled the product on the work surface and then placed it on the conveyor line beside her. Each operator was now responsible for the quality of her product, as well as for booking her total daily output.

At the end of this time observations were made, on the

criteria mentioned above, for a period of nine days, and the figures for unit production time and labour cost recalculated. Both sets of figures are shown below:[11]

TABLE 21 Results of Trial Application of Unit Assembly

	Assembly line	Unit assembly	Reduction	As a %age of total reduction
Clock mins. on measured work*	4.44	4.13	0.31	17.6%
Waiting time*	0.43	0.27	0.16	8.9%
Rectification time*	1.46	0.39	1.07	60.8%
Packing time*	0.51	0.29	0.22	12.7%
Total Clock mins. per unit.	6.84	5.08	1.76	100.0%
Labour cost per unit.	3.85p.	3.05p.		
Performance as %age of SP*	58%	54.5%		
SP, standard mins. per unit	2.59	2.25		

* These figures have all been calculated from those in the consultants' report.

It thus appeared from the results that a number of the objectives of UA had been achieved. Both unit production time and unit labour costs had been reduced, and this under conditions in which no financial incentives had been paid. Operators were however remunerated according to their

average earnings over the few months previous to the trial. At the same time the amount of time spent on product inspection and rectification showed a dramatic decline. The changeover then seemed successful, although the overall performance of the operators was still below 60% SP.

The question posed at the beginning of this Chapter was how one should explain these findings, and it is to this question we now turn. As we saw in the analysis of the consultants' report there was a certain ambiguity in the way future changes were described, and the 'languages' of both work study and job redesign were employed. The first point which strikes us about the results is that there was very little change in the performance levels of employees on the line, and on UA. Level of performance, expressed in terms of standard performance, is a measure of the quantity of work performed in a given period. If one assumes the operators are trained and capable of working at 100% SP, it is in fact a measure of the intensity of labour, of the amount of the working day devoted to working, rather than to waiting, 'idling' etc. Now many job redesign theorists would argue that a variety of changes in a job, such as increased responsibility, self-control of pace, 'wholeness,' feedback etc. would lead to an equivalent variety of changes in worker behaviour such as reduced absenteeism, increased output, better work quality etc. Although we do not have the precise figures, absenteeism for the experimental group did not differ significantly from that in the control group.

As regards output, we have seen that the intensity of working was no higher on UA than on the line. In part this was attributed to machine breakdown on UA, but the duration of machine inactivity - 6¼ hrs. - was a very small proportion of total working time (only 1.5) and hardly stands as an adequate explanation of the low level of production. But some of the job changes recommended by redesign theorists were definitely introduced - job 'wholeness,' responsibility for quality and self-control of pace. And when one also considers that there could well be an argument for the operation of Hawthorne effects in this case, the low level of output becomes all the more surprising.

It might be argued that the task changes themselves were hardly of momentous significance: the operators continued to perform an essentially simple and repetitive task many times each day. Why should one therefore expect any radical improvement in motivation from such an unpromising set of changes? Also, there are theorists who would argue that an increase in production should not be expected, and does not generally arise, from job changes of this sort. What does happen is that product quality improves, because this is the way in which employees obtain a sense of achievement.[12]

Such validity as these points possess, however, is somewhat limited. One must agree that the jobs on UA still require little skill, and will be repeated several hundred

times each day. But what we are examining here is not the apparent plausibility or otherwise of job redesign propositions, but whether or not those propositions have been satisfied by the conditions of this study. Granted, the changes in question were perhaps minor, but as Walker & Guest pointed out long ago, what appears minor to an outside observer may hold a completely different meaning for the workers involved.[13] There has been a transition from machine-control to self control of pace; responsibility for product quality, and for the booking of work has been introduced; and the operators on main assembly no longer perform only part of the final assembly, but perform all of it. And, one could add, the variety of work has, to a degree been increased, and new skills have been acquired during the period of training. These changes, if seen relatively, do conform to the proposals of many job redesign theorists, and for this reason constitute an adequate test of them. And Lawler's point about expected outcomes from job redesign has already been dealt with above, and will not be repeated here.

Given there has been no increase in ~~work~~ effort expenditure output per worker, it is true nevertheless that unit production time, fell by 35%, whilst unit labour costs dropped by 21%. Again we must ask about the causes of these phenomena.

If we turn back to Table 21 we can see that unit production time was reduced by an average of 1.76 minutes. Of this reduction, 1.07 minutes (or 60%) was due to the

savings made in rectification and inspection of the product. With the pacing effect of the line removed, operators were thus able to devote more time to the quality of their work, and since product quality was now their responsibility, they were compelled to devote this time to it. It should also be pointed out that on UA it was much easier for supervision to trace faults in the product to the operator responsible, than was the case on the assembly line and in this enhancement of social control one can see yet another tendency pushing in the direction of better quality work. A further 0.31 minutes was saved on each product through a simple reduction in the amount of time actually spent working on it. If we turn to the consultants' report we find a ready explanation of this occurence. Firstly in moving from the line to UA, a certain amount of unproductive time inherent in assembly line work was automatically eliminated, such as handling time for instance. Secondly, during the two months of training which they received prior to the experimental results being recorded, operators were taught systematically to work with two hands. Trainee operators had been taught two-handed work in preparation for assembly line work, but on UA this method of working was enforced much more rigorously than on the line. Thirdly, a certain reduction in work time had been achieved by the simple expedient of designing the individual work station in such a way as to make it both easier and quicker for operators to reach out and pick up their parts.

In view of the 'inefficiencies' eliminated by the abolition of the assembly line, it was perhaps surprising that unit production time did not fall even more dramatically. And in view of the element of 'job enrichment' it is surprising that worker performance did not rise above 60% S.P. Management too was surprised at these findings, if not actually disappointed, but in order to explain them we must resort to a discussion of motivation. The creation of a production system in which various forms of unproductive movements are actually eliminated means that with an approximately constant rate of performance, output will be higher as these movements are replaced by 'productive' movements, as happened in this case, But it does not mean that the free time now made available, stemming from balance-delay, and waiting time, will also be used 'productively.' Having released this free time from the constraints of the assembly line, management was now faced with the problem of ensuring that it was used 'productively' and not merely consumed by the workers in relaxation, social intercourse etc. It was faced, in fact, with the necessity to intensify the production process precisely because it had succeeded in raising its productivity. The restructuration of tasks, in addition to the provision of a guaranteed wage, had failed to achieve the required degree of intensification. Instead of there being more production and more working time,

management found the workers were turning out more production, but in the same time. Output then was increased, as was productivity, but these increases were due to methods improvements which cut unit production time. The consultants however pointed out that their results had been obtained without financial incentives, and that with their re-introduction, once the new payment system and payment levels had been devised, unit production time would fall further and total output would rise.

It has already been observed that the first report of the consultants contained a contradiction between its advocacy of job redesign and its stress on the use of MTM.2 in order to raise productivity. MTM.2 was said to reflect a Taylorist theory of work organisation in which methods of working were predetermined and specified for the worker. In contrast, job redesign theories have emphasised the importance of worker autonomy, over pace, methods etc. With the suggestion that worker performance could be raised by the use of financial incentives, the consultants apparently took a further step towards scientific management and away from job redesign.

In discussing category II job redesign, of which the present case is an example, it was suggested that productivity was increased by the operation of two mechanisms: methods improvements and pay rises and incentives. In the few cases on which data was available these mechanisms were empirically

conflated, but in the present case they were temporally separated. In the experimental trial, the performance of the workers remained below 60% SP, but output rose because of methods improvements. In the extension of UA to the whole shop the second mechanism, pay incentives, was brought into operation.

The extension of UA

When UA was transferred into the body of the shop, out of its experimental area, it was accompanied by revised payment levels. Basic rates were raised by an average of approximately 8%, and the incentive component was increased from 33% to 40% of the total wage, at 100% SP. This upward revision of the incentive component was designed to ensure that high performance was attained in the absence of machine pacing. At the same time the potential productivity increases arising out of the improved work methods, and the elimination of unproductive time were consolidated by management through an upward revision of the output required to achieve standard performance. Since the incentive component of the wage was tied to output, this meant in effect that the operators had to turn out more goods for the same earnings. It was anticipated by the consultants

that once the scheme was fully operational, productivity could be increased 75% and unit labour costs reduced by 32%, whilst earnings would rise only 18%. The results for the period Dec. '72 - Apr. '73 were remarkably close to these predictions.[14] With the extension of UA, and the introduction of the revised payment levels, productivity was increased by 70%, unit labour costs reduced 40%, and earnings increased by 15%.[15] Operator performance, which averaged 54.5% during the trial period, reached an average of 81% during these five months, an improvement attributed to the better supply of materials,and to the use of incentives.

The various features of job redesign, present in the UA trials, such as control of pace, responsibility for quality etc., had apparently failed to result in any significant increase in motivation, as judged by time spent working. What increased productivity there was, resulted almost wholly from methods improvements, such as the elimination of excess checking, and of handling time. Yet the same task, when performed under a regimen of financial incentives, and with improved materials supply, yielded an increase in performance from 54.5% to 81% SP.

The transition from flat rate payment to incentives was experienced only by those who had participated in the experimental trial. There were other workers in the shop,

apart from these 12, whose first contact with unit assembly involved no such dramatic change in payment system. In short they continued to receive financial incentives, on UA. Can we therefore say that the improved performance of these workers was due to financial incentives, or might it perhaps owe something to enhanced motivation derived from improved job content? I would argue that perhaps the significant factor in helping to raise performance levels of these workers was not so much the provision of incentives per se, as their transformation from a group to an individual basis, thus tying individual rewards much more closely to performance. This experience was common to both the experimental group, and those who later switched to UA. It should also be remembered that the improved job content did not raise performance levels of the experimental group, and it is therefore not very likely that it would have acted in a radically different manner when extended beyond this group.

The fact remained however that the performance level of 81% had often been exceeded on the assembly lines, particularly by the 9-3 shift of married women. Even in the most recent period, early 1976, when UA has been in existence for almost four years, and many of the 'teething troubles' have supposedly been overcome, management remained dissatisfied with the results. The scheme itself, they argued was successful insofar as it created surplus time

within the working day, but they themselves have yet to succeed in taking full advantage of this. The use of traditional rewards - financial incentives - had apparently not worked entirely; and the use of job redesign to enhance employee motivation appeared to have been even less effective, except perhaps insofar as it may have resulted in a slight improvement in product quality. Understandably, in this situation, the 'problem' was reconceptualised: it was not the workers who required motivation, but the supervisors. The raising of output was now seen to revolve not so much around the activity of the workers, but around that of their superiors. Supervisors and foremen, it was said, needed to play a more active role in stimulating performance, and incentives - both material and psychological - had to be described, and explained, to the workforce; those who lacked sufficient motivation to perform well had to be 'encouraged;' slacking had to be eliminated; and the pacing effects of the conveyor replaced, in part, by the actions of the supervisor; and, finally, materials supply had to be more effectively managed.

This perspective was echoed by the supervisors themselves. One of them suggested that the absence of pacing on UA rendered the supervisors' job more difficult, as the workers were able, and did, take more time off to go for a chat or a quick smoke. Since the base rate for wages was higher than on the assembly line, that too constituted a certain disincentive to work. And finally, since part of the 'self-control' on UA involved booking one's own output, it was suggested there was a tendency

to overbook. The general idea that UA was 'harder to control' was also supported by the foreman in charge of the assembly section, who also pointed to the necessity to compensate for the absence of the conveyors pacing effect. What was significant about this new 'perspective' was that it marked a complete break with the traditional job redesign ideas of worker autonomy, self-control etc. as integral to increasing productivity. In their place was substituted a further component of the Taylorist theory of management. We have already observed the way in which the disappointing results obtained during the UA trials were attributed to an absence of financial incentives, and it was remarked that this stress on financial rewards, as opposed to those inherent in task performance was a characteristic feature of Taylorism. With the 'shift' to an emphasis on the necessity for supervisory control, yet another feature of Taylorism made its appearance. The significance of these moves is an issue we shall take up in the conclusions to this case.

The labour force and work output

The problem of UA was not generalised throughout the whole of the workforce, and it was claimed, on the basis of weekly performance figures, that whilst a proportion of UA workers produced a high level of output, rather more workers used their new found freedom to engage in conversation etc. This division of the workforce leads us to two conclusions,

neither of which appears to be compatible with two of the major job redesign theories. The group which performed well on UA tended to be mostly older married women, that is married women in their late 20s and 30s. It was noted at the beginning of this report that the most productive shift in the factory - the 9 - 3 shift - was composed of precisely these sorts of people. Although the husbands of the majority were also working, their motivation to perform at a high level chiefly reflected their economic situation, in which, with a house and children, and with rising prices, their need for money was strong. Women in this category then worked hard whatever their work, whether it was sub-assembly, assembly or unit assembly and we need have no recourse to theories of job redesign and intrinsic motivation to account for their behaviour on UA.

The second group consisted of younger girls, some of whom were married, but many of whom were not. Although management, and supervisors, suggested their 'need' for money was that much less because of their domestic situation (that is, being without children), the situation was not quite so simple. There was certainly no compulsion to earn money of the sort which resulted in the high performance levels among the married women, but there may well have been a desire to earn money in order to support an extensive social life. Performance levels among such girls on UA varied between 60 and 80, and it was assumed this wage-effort trade-off was adequate so far as the girls themselves were concerned. What

appeared to concern them far more than the 'intrinsic satisfaction to be derived from task performance,' was the satisfactions to be derived from social intercourse. Unfortunately, for management, the unit assembly stations had been designed and located in such a way that it was difficult to talk and work simultaneously. In order to do the former, it was necessary to turn away from the assembly station, and away from one's work. Contrast this situation with the assembly line, where, as it was generally observed, the workers appeared to be part of a social group, and regularly talked among themselves at the same time as they worked.

It would appear therefore that the management had abandoned, or forgotten, not only some of the ideas of job redesign, but those of Mayo, and the Hawthorne studies, as well and the 'social needs' of the workforce seem to have been sub-ordinated to the demands of production.

Conclusions

Category II redesign

In Chapter 7 it was suggested that in category II redesign there was, in addition to direct intensification, the use of methods improvements, in order to raise productivity. Indeed, on the basis of a number of studies, methods improvements were seen as the major element in this category of redesign since they appeared to account for a great proportion of

increased productivity, but, more importantly, because they derived directly from despecialisation of labour, the hallmark of redesign. Direct intensification was seen as a separate process, in no way connected with redesign per se, and attributed to the operation of financial incentives. In the present study we have been able to observe these processes separately, and it can be seen that they are indeed quite distinct. In the experimental phase of UA, productivity was raised by means of method improvements, some, though not all, of which derived from the abolition of progressive assembly, e.g. the elimination of handling time. At the end of this phase productivity had been raised by 35% although employee performance, measured against standard, remained unchanged.

The second attempt to further increase output and productivity had nothing to do with 'job enrichment,' strictly speaking, but simply involved raising the basic rate of pay, and increasing the incentive component of earnings. As a result of this change, productivity was increased by the same amount again, as in the UA experiment. The total productivity increase, measured against pre-UA performance was 70%, but it should be noted that this pre-UA level was unusually low. Compared with the more usual assembly line levels of output, of the order of 75 - 90% SP, the use of UA with incentives raised output by approximately 35-40%.

Unit assembly and scientific management

In Chapter 7 it was argued that category II redesign constituted "the most thorough and consistent application of Taylorism," because of its individualisation of the work process, its attempt to increase control and accountability of the worker, its use of work and method study, and of financial incentives. The ambiguous usage of the term "job enrichment" was made clear at the very beginning of this chapter when we examined the consultants' first report to the company on work reorganisation. It was noticed that in a report which addressed itself to traditional work study problems (excess indirect labour, excess unproductive time etc.) using traditional work study methods (MTM.2, intensification of labour), the idea of 'job enrichment' sat rather uneasily. In assessing the results of the UA trial, we indicated that the various benefits which accrued, reduced unit production time, higher productivity, and reduced labour costs, could all be accounted for without reference to the theories of motivation underlying job redesign.

Subsequent performance improvements materialised in response to the re-introduction of financial incentives, raising of the basic rate of pay, and tightening of supervision.

This final decision however did not mark a sudden break with the theory and language of job redesign but represented a consummation of tendencies inherent in the project from its inception. Firstly, the initial report spoke both of work study problems and techniques, and of 'job enrichment,' a contradiction which might have allowed movement towards either of these poles; secondly, the productivity increases during the UA trial could in fact be accounted for in terms of method improvements arising out of the application of work study; thirdly, the absence of any change in performance level was attributed to the corresponding absence of financial incentives, and indeed, when these were reintroduced (in conjunction with improved materials supply) performance levels did rise; finally, having individualised the work process, employed work and method study, and utilised financial incentives, it was but a small step to complete the Taylorist trend and call for the tightening of supervisory control. It can be seen then that this final move was consistent both with the initial project, and with its subsequent development.

This argument may be objected to on at least three grounds: first of all it could be said that the management was not strongly committed to the ideas of job redesign and thus failed to create a fertile climate for its existence;

secondly, it could be said that the workers themselves were not sufficiently interested in job redesign, and did not therefore respond to improved job content as would be predicted; and thirdly, it could be argued that since the project did 'shift' towards Taylorism, that the element, and the significance, of job redesign in the initial report was largely 'cosmetic.' So let us examine each argument in turn.

Management and job redesign

It was undoubtedly true that the Meccano management did not elaborate their programme of job redesign into a "new" managerial philosophy, as was done at Shell, Philips or ICI. But then cases such as these are the exception and not the rule, for the overwhelming majority of job redesign changes have also been initiated without benefit of a revised philosophy on the part of the organisational leaders. The cumulative experience of these cases, reviewed in Chapters 6 - 8, lends no support to the view of writers such as Wilkinson,[16] and Klein,[17] that top management support for, and commitment to, job redesign is an integral, and a necessary feature of a successful innovation of this type. In the present case commitment to the ideas of job redesign

was weak, and in retrospect the managers who were interviewed considered the redesign element of the work reorganisation to have been only a minor feature. But the progressive introduction of scientific management mechanisms, and the underfulfillment of management's expectations were not the results of a lack of commitment to the philosophy of job redesign. Rather, it was the relative ineffectiveness of job redesign that was responsible for the decline in commitment, and for the introduction of further elements of scientific management.

Naturally, this argument only has the character of an assertion, but in the light of the results of the UA trial and extension, it seems a plausible assertion nonetheless.

Worker attitudes and job redesign

A recent journalistic investigation of Meccano's unit assembly system reported that the workers were 'surprisingly enthusiastic about it' considering the scheme had been introduced four years previously.[18] According to the report they particularly liked the individual payment system, but no other views were mentioned. According to the managers, and particularly, the shop steward, interviewed in the present case, the major grievance about unit assembly

concerned the absence of opportunities for interaction, and we have noted that the layout of the assembly stations makes it difficult to talk and work simultaneously. This complaint about interaction opportunities echoes similar complaints made in other cases of category II redesign, reported by Conant & Kilbridge,[19] and Thornely & Valentine[20] for instance. We must however separate employee attitudes and behaviour, at least analytically, for in these other cases of category II redesign, productivity and output both increased <u>despite</u> employees' reservations about social restrictions. A similar phenomenon seems to have occurred in this case amongst the two groups of employees, married and unmarried, whom we discussed earlier. The older, married women tended to work hard, whatever the organisation of work, and their behaviour on unit assembly would not seem to require reference to their specific attitudes to job content on the assembly line and unit assembly. This is not to say they had no preferences between the two modes of work organisation, but only that such preferences as they may have had were not critical in accounting for their work behaviour.

All we know about the younger, and unmarried workers is that they tended, more than the older co-workers, to complain about the isolation of unit assembly. Nevertheless this did not prevent them from reaching levels of performance above those previously obtained on the assembly line.

The use of "job enrichment" language

If, as has been argued, the exercise reported here consisted of a 'thorough application of Taylorism,' and that its 'job enrichment' content was gradually dissipated in favour of an explicit resort to Taylorist principles, what role, if any, did the terminology of 'job enrichment' actually play in the consultants' first report? One could say it was merely a piece of 'window-dressing,' designed to appeal to modern management, and to secure the support of the trade unions. The latter objective had of course been mentioned by the consultants as a criterion which any proposed reorganisation would have to meet if it were to be successful. Whilst there may have been some element of intended legitimation, of an activity that may otherwise have been perceived as a straightforward 'productivity deal,' one cannot dismiss the changes as window dressing for the changes made in job content were quite definite, and in accordance with the job redesign criteria of various theorists. Its use may also represent the development of a certain theory of motivation, and a corresponding specialist language, within the circle of management consultants and theorists, and in this sense the consultants merely reflected, and partook of, this general theoretical development. Similar developments may not have taken place inside the company management and it appears that their response to the first report focussed largely around the use of methods changes, and MTM.2 analyses rather than to elements of

'job enrichment.' Nevertheless, a process of job redesign did take place within the company regardless of whether it was seen as such by the managers involved.

This discrepancy between managerial attitudes and the objects of those attitudes should occasion no surprise, certainly in the present case, for two reasons: first of all, category II redesign (flow line reorganisation) has been analysed as a consistent application of Taylorism, and the development of an explicitly Taylorist practice in the present case (with regard to supervision for instance) was an expression of this fact. But over and above the specific features of flow line reorganisation, different functional types of manager may not have the same interests, or the same understanding of interventions in the production process. Thus, as we shall see in a later case, the interests, perceptions, and more importantly, the assumptions, of personnel and industrial engineering may be quite discrepant, and the overall policy emerging from a management group quite contradictory.

Theories of job redesign

The Meccano case provides us with a rough approximation to a controlled comparison of the 'classical' job redesign theories (Herzberg, sociotechnical theory, and task design)

with the theory offered in the present thesis (Chapter 5). In the UA trial, pay levels were held at the average for the preceding months, whilst job content was enhanced in the directions of increased variety, autonomy, responsibility and 'wholeness.' At the end of this period productivity had increased by approximately 35%, but we saw that the majority of this improvement could be attributed to the rectification of structural defects in flow line organisation (see Chapter 5).

In the second phase, job content remained as before, but pay levels were raised, and individual incentives introduced. Again, productivity rose by 35%. Of the total productivity increase therefore, the overwhelming majority can be attributed to the operation of two mechanisms central to the theory advanced in this thesis: pay rises and incentives, and work methods improvements.

CASE 2 - THE DAIRY

The South Suburban Co-operative Dairy serves a large area of South London. It consists of a processing plant, a bottling section, and the organisational centre of a wide distribution network. The management of the dairy has not undertaken, in a formal sense, a job redesign project, but over the past 15 years it has been economically compelled to adopt forms of job redesign, and its recent history is interesting as an illustration of these pressures. Information on the dairy was obtained from two interviews with the Dairy Manager, and one with the Chief Foreman. On the dairy industry in general interviews were also held with dairy managers in West Nottingham and Manchester. Finally, information on the 1971 and 1973 productivity agreements was obtained from company files, which contain minutes of meetings, proposals and recommendations submitted to negotiation, and correspondence between the dairy management, and the union officials (USDAW).

The dairy industry, in common with many other industries, has initiated a series of large scale capital investment programmes since the war, and the trend, in this industry as elsewhere, is for the capital-labour ratio to increase. Apart from the necessity to raise productivity, and hence profitability, the dairy industry has also been subjected to Government restriction. In return for large subsidies to the industry the Government has insisted on the power to regulate the maximum retail price of milk. Thus, where many manufacturers

might raise prices, and extend credit, to offset declining profit rates, this avenue has been closed off to the dairy industry. The option pursued has been that of a drive to raise productivity, chiefly, though not exclusively, by the introduction of machinery. The processing phase of production is already capital intensive, the distribution network, labour intensive. The latter however seems unamenable to capital investment or technological transformation, and over the past 15 years change has been concentrated in bottling. Let us therefore briefly describe the stages in this process, at its present technological level, before proceeding to consider some of the recent changes.

There are two entry points to the bottling section - at one there enter returned bottles, and at the other crates. These proceed independently along motorised conveyors into washing machines, out of which both emerge washed and dried. In addition of course, the bottles are sterilised. From there the bottles proceed along more motorised conveyors to a filling machine, which is fed with milk from the processing plant on the floor above. The bottles pass beneath the filler, and having been filled, are moved along the conveyor to the capping machine. They pass on a circular conveyor around the capper, and then proceed to the crater. This machine takes bottles, and drops them into the crates, which are fed by conveyor into its rear. The filled crates then pass on towards the loading bay, ready for distribution. Traditionally, that is in the 1960s, workers were assigned to separate jobs on bottle washing, crate washing, filling,

capping, crating, and a number of other ancillary processes, such as maintenance, inspection of lines, pipe cleaning etc. With increased capital investment throughout this period, there began a drive by management to raise labour productivity by cutting the labour force. The two peaks of the investment programme occurred in the early 1960s and early 1970s, and the following figures give the total number of workers employed in the bottling department, including supervision and maintenance, and excluding clerical staff.[21]

TABLE 22 Labour in the bottling department, 1963 - 74

1963	1970	1971	1972	1974
77	62	53	48	42

During this period production volume had increased considerably and shift working had been stopped. In the early 1960s there were two shifts in the department, 6-2 p.m. and 2 - 10 p.m., but after extensive mechanisation in 1963-64, this was stopped, and the department went over to daywork.

The reduction of the labour force was however only one pole of what was in fact a dual 'strategy,' the other pole being concerned with the labour force that remained in production. From 1970 to 1973 negotiations between management and unions concerned both the reduction of the labour force, as well as the intensification of the labour process. This

intensification was to be conducted by means of 'flexibility agreements.' According to the minutes of a meeting on 30 Oct. 1970, the union was told that,

> "Staff would be completely interchangeable including occasional Creamery work and where applicable would receive additional payments." 22

and "Emphasis was put on the necessity of training Dairy Staff in different jobs,.....".[23] And the point was reiterated more forcefully in a letter from the Dairy Manager:

> "The habit of restrictive practice among sections of the staff must end. In future Management reserve the right to interchange staff for any reason,....." 24

And the Group Personnel Manager repeated the assertion the following year:

> "Flexibility of working is a key to the Dairy's success and men must be prepared to gain additional skills and give assistance where it is required." 25

Finally, in 1973 a productivity agreement was drawn up which included cancellation of overtime payments, reduction of grades to a single grade, reduction of manning, and flexibility of labour.

> "(c) (c) That all inside Dairy Operatives are fully interchangeable to do such jobs as directed.....
>
> (e) Finishing time will be such time as the Foreman in Charge indicates and will be such time as he considers the Dairy to be clean and ready for the next day's work." 26

Prior to the early 1960s mechanisation, a separate night shift had been employed solely for cleaning, but following mechanisation the shift was abolished. Some of the cleaning was rendered unnecessary by the changed machinery, whilst the remainder was taken over by machine minders (Dairy Operatives) and performed, usually at the end of the day.

In a statement summarising the advantages and benefits of the 1973 scheme, the Dairy Manager once again observed that an essential component was,

> "An understanding that flexibility is necessary, where practical." 27

In practice, flexibility involved deputising for workers who were absent, or moving from bottle intake onto cleaning once the former process was completed. In addition, management had succeeded in replacing traditional one machine - one man assignments with arrangements in which two men looked after three machines, the filler, capper and crater, an arrangement facilitated by the juxta position of the machinery and the provision of fixed mirrors.

Summary and conclusions

This case has a number of features in common with category III redesign. To begin with, the 1973 agreement occurred in a continuous and semi-continuous process industry, and it was in this type of industrial situation that we found a predominance of flexible work groups. Conversly, of all the cases of category III redesign, 42% were found to have occurred in this sort of industrial situation. Another characteristic feature of these industries is their high capital-labour ratio, and a correspondingly low volume of labour. The low volume of labour places a premium on its efficient utilisation, but why should this take the form of flexible work groups, or of flexibility

agreements? Part of the answer may be that the nature of the work to be performed in these industries is such that operators spend long periods of the day simply monitoring machinery, or being on stand-by in case of breakdowns. This type of activity profile is common in sectors of the chemical industry and has been documented by several research workers.[28] Management then was faced with a group of 'fractional work roles' as a consequence, in part of mechanisation, and they took the opportunity to try and economise on labour costs by combining some of these roles and reducing the size of the labour force.

In the present case the redesign of roles which occurred did not take place under the aegis of a 'job redesign' scheme. That is to say, the theoretical, or perhaps ideological, form of the activity did not draw from the tradition of job redesign. But despite this, the activity itself, however conceptualised, did correspond to a category of job redesign labelled as flexible work groups. The case may then be taken as illustrative of a possible economic basis for the content, though perhaps not the form of job redesign in highly mechanised industries. The degree of redesign should not be overstated: management proposed to introduce labour flexibility as an emergency measure to cope with labour shortages or production fluctuations. Under 'normal' conditions an extensive division of labour would continue with workers distributed between the different machines, and the various loading and unloading areas. The recent introduction of job rotation among the machine operatives

reflected an attempt to reduce labour turnover, rather than to restructure division of labour, as well as being part of the training requirements necessary for flexibility.

The absence of the theoretical concepts of job redesign had a number of consequences for the form of job redesign that was actually introduced. The cases examined in the previous chapter (8) frequently, though not always, involved worker control over the allocation of labour between different functions. But in the present case, where no theoretical value was attached to such notions as 'autonomy,' allocation of labour remained under the control of supervisory staff. Nevertheless, in terms of the means by which productivity was raised and costs reduced - intensification through flexibility, and labour elimination- the present case is clearly an instance of category III redesign.

Finally, it should be noted that in this production system, where output was largely under machine, rather than worker, control, the introduction of flexibility so as to raise productivity, necessitated the elimination of labour. This case then illustrates one of the major economic losses suffered by workers as a result of job redesign, namely loss of jobs.

CASE 3- UNITED GLASS LTD

United Glass, like Meccano in the earlier study, is another company which conducted an exercise where the concept of 'job enrichment' played a somewhat ambiguous role. Ambiguous in this case because conjointly with a process of job redesign the company had also initiated some specialisation of labour. The case is also of interest because it illustrates a point made by Donaldson on the differing interests of various sections of management, here, the industrial engineers, and the personnel department.[29] That these groups held very different attitudes to 'job enrichment' will become clear as the case unfolds. The final point of significance about the case is that in the new plant where there occurred both processes of specialisation and despecialisation, the former was in some measure a reaction against an earlier recombination of jobs in the older plants. This recombination was considered to have had a deleterious effect on product quality, the reasons for which will be examined in some detail.

Data on United Glass was obtained from many sources: firstly, from a report on the Castleford plant prepared by the Work Research Group at Henley;[30] secondly, from interviews with managers, shop stewards, foremen and workers, conducted over a three day period at the same plant by myself; thirdly, from personnel records at the same plant; fourthly, from four interviews with the Group Personnel Officer for Industrial Relations: fifthly, from interviews, and observations

at the new Alloa plant: the interviews were conducted with the Factory Manager, Chief Industrial Engineer, Personnel Officer, and Work Study Officer; sixth, from notes taken at a Divisional meeting of Factory Managers, Industrial Engineering and Personnel, to discuss new modes of work organisation; seventh, from internal company reports, documents, and memoranda connected with the above meeting, and other discussions of a similar nature; eight, from written job descriptions at the Castleford and Alloa plants.

The company produces glass containers, as well as moulds, plastics and ornamental glass, but all of the changes to be described in this report took place in the main manufacturing section, the glass container division. The company is jointly owned by Owen-Illinois of America, manufacturers of glass packaging, and by Distillers, although it appears to enjoy almost as much autonomy as before its takeover. The administrative centre is located at Staines, and major plants are at Harlow, Castleford, Peasley, Alloa,and Glasgow. Each plant has its own factory manager, to whom all specialist management functions are accountable, as for example, industrial engineering, production, personnel etc. Each specialist function in a plant is also accountable to its own superiors in Head Office (at Staines), and the factory manager is accountable to the Manufacturing Director, also at Head Office. In practice, the factory managers were allowed to exercise considerable discretion over a variety of less important issues, although whether central control might have been reasserted in the event of a major disagreement is a possibility

about which we can only speculate. Certainly, when the Harlow plant was encountering industrial relations problems in the late 1960s, directives were issued from Head Office on ways of dealing with these problems.

The production process in these plants must now be described if we are to understand the proposals for work reorganisation that were discussed within the company. The production of bottles, or other glass containers, is conventionally divided into two phases, the hot end, and the cold end. The hot end consists firstly of the production of glass by mixing and heating silica, sand, limestone and cullet. The molten glass is then poured into moulds, a process supervised by the moulding machine operator, and from there proceeds through the phase of annealing. This is a process of controlled cooling, in an oven, known as a lehr. At the end of this process the containers emerge on a conveyor belt and proceed through the 'cold end,' where they are inspected, both automatically and manually, and packed. Hot end work is paid at a higher rate than that in the cold end, and is regarded as skilled. Cold end work requires several weeks or sometimes months of training before the operators are able to detect all of the 100 or more possible faults in a container. Nevertheless, the work at the cold end is considered to be only 'semi-skilled.'

Management and job redesign

According to Donaldson,

> "Discussions at a distance from job enlargement exercises tend to portray the motives as simple,

> unambiguous and being the straightforward projection of some purpose by 'the management.' "31

But the situation is actually more complex:

> "In reality the various parties in the change process may include several different disciplines and interest groups .....forming a more or less integrated coalition in order to pursue their multifarious goals." 32

This was certainly the situation at United Glass, and the re-emergence of a behavioural science aspect to the discussion around the new Alloa plant owed much to the Henley report, mentioned earlier.[33]

This report set out to examine the effects of job rotation in one shop at the Castleford plant, through use of the Turner & Lawrence Requisite Task Attributes Index, and to offer suggestions for work reorganisation so as to enhance both worker motivation and satisfaction, as well as productivity and product quality. These included recommendations for increased job rotation, enhanced worker responsibility, and the establishment of semi-autonomous work groups. After lying dormant for nine months the report was reactivated by the Group Personnel Officer for Industrial Relations, who subsequently obtained the support of the Manufacturing Director for the idea of increased behavioural science involvement in the company.[34] Coincidentally with these developments, I first approached the company and became involved in the attempts of Personnel to extend the job redesign aspects of the NLO programme. This was an integral part of work changes being introduced at the new Alloa plant. This plant opened in 1976, and represented a high degree of

investment, that was itself highly capital intensive. The changes in work organisation provisionally known as the 'New Look Operative' (hereafter, NLO) combined certain quality control duties with responsibility for machine running and a measure of former, supervisory control over labour allocation. At the same time adjacent work roles, such as that of the packaging machine minder embodied a degree of specialisation as compared to the older technology and organisation. Discussion within the company reached its peak at a meeting on 5 November attended by Factory Managers, Divisional Personnel and Industrial Engineering and plant representatives of these specialist functions.

The discussion was centred around a specially prepared document, and we must therefore give some idea of its content. There were two principles underlying the document:

> "New look type systems have developed by extending the principle that all mould cavities should be inspected at regular intervals at the cold end, together with the principle that, wherever possible, sorting should be divorced from packing operations." 35

The advantages of the system were said to be improved quality, optimal manning levels, stock reduction, and "job enrichment of the personnel employed." The 'New Look Operative' was also said to be "the key man in the new system." There can be no doubt that this role was enriched as compared with the older organisation of work. Under the old system bottles emerging from the lehr passed along a motorised conveyor, through a small quantity of inspection machinery, finally

to be inspected visually, and packed in cartons, by the sorters at the end of the line. During their progress along the line, an operative called a Cavity Sampler, or Quality Checker, would take regular samples of bottles and check them for certain standard faults. Any relevant information was then fed back to the hot end. In addition this operative was responsible for ensuring the continued functioning of the automatic inspection machinery, and for notifying faults to the foreman. These duties were now subsumed under the role of NLO, who was responsible in fact, for far more machinery than the Cavity Sampler, and he was also assigned authority to requisition labour as required. The former sorter had the majority of his inspection duties removed, and was assigned to machine minding on the automatic packager.

The discussion document then gave summary descriptions of the main work roles required in the Alloa plant, and the Appendices provided comparative data on manning levels and line speeds from several UG plants, as well as from a parent company plant in the U.S.A. Also in the Appendices was a sheet headed 'Flexibility and Job Enrichment,' which discussed the possibilities for labour flexibility, and indicated, as its chief advantage, the reduction of line manning levels.

The Personnel function, as we have said, reactivated a discussion on behavioural science within the company. At the Nov. 5 meeting the contributions of the Personnel Officer and myself focussed on the element of 'job enrichment' in the NLO document and tried to argue for its extension to other operatives. In particular the question of the specialisation,

or impoverishment, of the packaging machine minder was raised as incompatible with a stress on 'job enrichment.' The argument for job 'enrichment' offered by Personnel was the standard argument used in the literature: improved job content will result in more satisfaction and motivation, and thus lead to higher productivity and quality of work. It also presupposed a certain theory of motivation, in which workers were seen as willing to increase effort, given the chance, and which, to some extent, downgraded the role of pay and external controls (the carrot and stick approach). The strongest attack on these views came from Industrial Engineering, who supported the granting of more job complexity and authority to the NLO, but who wished, nevertheless to divorce sorting and packing operations. It was said that workers could not reliably inspect their own work, and that the compulsory union of sorting and packing on the single-line conveyors in the cold end had led to a deterioration in quality. Before the use of the single-line conveyor, sorter/packers had worked at the very end of the lehr, alongside a very wide conveyor. Although nominally responsible for sorting and packing, the group of 5-6 men sometimes divided the work - half sorted, whilst the others packed.

At a more general level, it emerged that Personnel was opposed to specialisation of labour, and was arguing for an extension of despecialisation. Industrial Engineering on the other hand held no principled view on specialisation, but argued pragmatically for specialisation, or not, on the merits of each particular case. The over-riding concern of IE was to

maintain quality standards (production volume being chiefly a function of activity at the hot end) and the argument against the combination of sorting and packaging reflected both their experience and their assumptions about the work-force. Figures were produced to demonstrate that with the transition from sorting on the lehr conveyor to sorting on the single-line conveyor (inline sorting), quality had deteriorated, i.e. customer complaints had increased and sorter effectiveness decreased. This result was attributed by IE to the process of despecialisation, enforced by the inline system, although the workers themselves, when interviewed at Castleford, universally felt it was due to insufficient manning and increased pace of work, which made proper working difficult.[36] Whatever the truth, IE in any case assumed that workers were motivated by a desire to maximise the wage-effort bargain in their own favour. This assumption was held both by Divisional, and by factory industrial engineers, and clearly set them apart from the assumptions underlying job 'enrichment.'

Finally, there was disagreement amongst management over the nature of job 'enrichment' in the NLO document - was it an end in its own right, or only a means to an end? The arguments of Personnel implied that it was an end in itself, although the alleged benefits of 'job enrichment' were stressed, in terms of productivity and product quality. No answer was made however to the claim by IE, regarding the deleterious effects of the combination of sorting and packaging. For IE, the element of 'enrichment' was seen as a means to an end, although

the posited ends differed between different members of I.E. Why then did I.E. support the concept of the NLO at all? The answer, in part, is that they saw the enhanced authority of the NLO as necessary for the effective performance of his job. In the new Alloa plant, there would, at any one time be relatively few workers in the region of the cold end, and the foremen would often be occupied with other duties, possibly elsewhere in the plant. The crucial importance of product quality in the glass container market made it imperative that decisions affecting quality be taken as quickly as possible before too much 'damage' had occurred. In addition, any delay in fetching extra labour, or mechanics, could result in the stopping of the line, and in view of the large amount of capital invested in the Alloa plant, this was seen to be a wholly undesirable eventuality.

Apart from considerations of capital investment and product quality, there was also an argument, shared by Personnel and I.E. on the importance of eliminating labour from the production process. Under the section headed 'Flexibility and Job Enrichment' appeared the view of Personnel. The cold end production line ought to be staffed permanently only by the NLO. Additional duties, such as visual inspection or machine-minding, would be performed by members of a labour pool, who, when not working on the conveyor line, would be engaged in resorting returned containers or covering for workers absent from other ancillary functions. They would, in short, be flexible, perform a

variety of jobs, and thus experience 'job enrichment.' The objective of this proposal was identical to that of I.E. namely to reduce labour on the production line and avoid rigid manning levels. In a document written after the Nov. 5 discussion, a Divisional Industrial Engineer proposed a modified NLO scheme, the precise details of which need not concern us at present. The object of this proposal was to ensure control over labour costs and product quality, and it finished on the following note:

> "An effective monitoring control will be necessary to prevent full manning of the lines becoming the norm." 37

Meanwhile, the behavioural science support continued to organise its activity. In late November, after a visit by the Group Personnel Officer and myself, the management at Alloa received a proposal from us outlining a social psychological study of the opening and early functioning of the new plant. The concern expressed during the visit at the amount of time such a project might consume crystallised into severe doubt on their receipt of the detailed proposal, and the project was cancelled.[38] Shortly beforehand the Group Personnel Officer had organised a day school at the company H.Q, addressed by Gilbert Jessup, and others from the Work Research Unit, to which senior divisional managers were invited. Whilst many were impressed by the speakers, and their contributions, there remained a feeling that the company was not yet ready for a major project of the sort vaguely hinted at in the day school. When the rejection of the research proposal reached the manufacturing director

from Alloa, he acceded to their wishes, and perhaps also to the feelings of some of his senior managers, despite his guarded support for the use of behavioural science, expressed at the 5 Nov. meeting.

Clearly, there may well have been more to management's decision than was expressed in letters and memos and at meetings, and this account must therefore be seen as tentative. It does nevertheless illustrate concretely, some of the notions which Donaldson discussed in his own paper on the subject. In that paper he described job enlargement as a "vehicle" through which different management specialists sought to achieve their particular aims.[39] In the light of our own report we could perhaps modify this instrumental idea of 'the vehicle.' For in our case the consequence of IE's instrumental attitude to job 'enrichment' was that in an adjacent situation - that of sorting/ packaging - they were prepared to abandon 'enrichment' when another 'vehicle' proved more suitable for their ends. In the case of Personnel on the other hand, there was an altogether more intimate link between the vehicle and their ends, a link which compelled a commitment to the vehicle in and of itself. This link between means and ends was much more tenuous in the case of I.E. and hence more vulnerable to modification, or even abandonment.

The meaning of 'Job Enrichment'

We have already seen that whilst both I.E. and Personnel supported the creation of the 'enriched' NLO role, Personnel

wished to extend 'enrichment' to other operators and, by implication, argued that the NLO was inadequate as a programme of 'enrichment.' Paradoxically, the proposed extension of redesign by proponents of the theory and practice of redesign, involved simply an increase in job variety. It was not proposed to grant workers additional authority, as had been done to the NLO by Divisional IE. One might even say then that the IE understanding of job redesign appeared to be more sophisticated than that of its proponents, insofar as it did not restrict the term to 'variety' but covered responsibility and decision-making as well.

There was certainly little clear understanding of job redesign theory or practice either by IE or Personnel. The former arrived at their redesign scheme via the route of efficiency in decision-making, whilst Personnel advanced the limited notion of variety for three reasons.[40] Firstly, it reflected, as in the case of their IE colleagues, a limited understanding of redesign concepts, and what little understanding did exist was introduced by the author, and later, by the Work Research Unit at the day school organised by Personnel. Secondly, it reflected the view that within the constraints of the work and technology that was available, an increase in work variety was as much as could be hoped for. Thirdly, it reflected the appreciation that if any more radical change were to be made in the job content of the semi-skilled workers, this could only be at the expense of the NLO, whose authority might have to be eroded in order that the authority of semi-skilled workers might be increased.

Although IE treated job redesign as an exercise that could be conducted in isolation from the rest of the organisation, it was possibly the perception of some of its far-reaching ramifications which was partly responsible for the onset of cold feet in the company in early December.

Job redesign and specialisation of labour

As the previous sections implied, it was the Divisional IE view of job redesign that prevailed within the organisation. One of its components was a pragmatic approach to the issue of labour specialisation, a pragmatism illustrated clearly in its proposals for the Alloa plant. On the one hand, the old role of Cavity Sampler was to be invested with almost supervisory authority, whilst on the other, the functions of sorting and packaging were to be separated. It has been argued by a number of writers, e.g. Wilkinson, Klein,[41] that the support and commitment of top management is essential for a successful job redesign programme. In the light of the present case, it might be more correct to say that top management support for job redesign theory and practice is essential for its comprehensive and consistent application, although not necessarily for its success. Had top management been committed in the present case to job redesign it may have objected to the specialisation of the sorting/packaging function but it is difficult to see how its attitude on this issue would have affected the success of the NLO redesign.

If the literature of job redesign is taken at face value it appears that very few companies have transformed job redesign from a mere strategy, useful om occasion, into a principle and a philosophy. Shell, ICI, Volvo and Philips are the few examples which immediately spring to mind, but it will be found that to try and appreciably extend this list is an extremely difficult task. Companies such as United Glass, which used job redesign at the same time as specialisation of labour, may therefore be regarded as, at the very least, not unusual, and perhaps even as the norm. Of course the close juxta position of the two opposed processes in the Alloa plant was perhaps unusual, but since it resulted from no firm commitment to one process or the other, per se, it was the sort of coincidence that might well occur in the plant of any company using job redesign in a strategic, rather than a principled, way.

Conclusions

What does this situation - the reversal of despecialisation accompanied by the despecialisation of other roles - tell us about the practice, and about the future of job redesign? The case indicates, in very striking form the consequence of

a pragmatic orientation to job despecialisation, namely the co-existence of labour specialisation. The presence, and use of the former, by no means excludes the use of the latter, and the apparent contradiction between the two processes, and their underlying philosophies is resolved at a higher level, that of objectives.

Secondly, if we consider this consequence over an extended period of time, then we may conclude that the increased use of job redesign, or despecialisation, in no way presupposes, indicates, or results in, the declining use of specialisation of labour. A number of writers on job redesign, notably, for example, Davis, have made the error of discussing job redesign and labour specialisation as incompatible and exclusive philosophies of management, entailing in their turn radically different views of human motivation.[42] On the assumption that management is a more or less unitary entity, with a coherent philosophy, the authors then proceed to draw the conclusion that environmental and other pressures are pushing management away from a Theory X philosophy and towards a Theory Y type view.[43] The present case serves to question this chain of argument at several key points. Firstly, it shows that whatever the philosophical incompatibilities, job redesign <u>can</u> be used alongside labour specialisation. Practically speaking, the apparent contradiction here is resolved at the level of company objectives. This fact should indicate both the erroneousness of examining management practice largely at the philosophical, or theoretical level,

as well as the falsity of the assumption that from such a philosophical standpoint, management does, or must, have a unified theory. In the present case management employed a redesign strategy, which itself rested on differing philosophical views, embodied in the positions of Divisional IE and Personnel. And this fact in turn demonstrates the invalidity of treating management as a homogeneous social category.

Thirdly, the case indicates at least one of the contradictions between managerial objectives and job despecialisation, as a result of which despecialisation may be reversed. In its desire to reduce labour costs, and what it defined as over-manning, the company succeeded at the same time in reducing the efficiency of quality inspection. For the despecialised role of sorter-packer to have functioned effectively on inline sorting, it may have been necessary to leave manning levels unchanged, or to effect only a small reduction. In practice the company went to the other extreme, and made significant savings on costs, at the price of poorer quality of finished goods.

* * *

The conclusions from this chapter, and from the literature review will be elaborated in the ensuing chapter.

NOTES AND REFERENCES

1. Butteriss, M. & Murdoch, R.D. 1975; Harvey, 1973; Anon. Doing their own thing at Meccano, 1975.

2. Standard Performance is a technical concept used in work measurement and defined by Currie as follows:

> "By standard performance is meant the optimum rate of output that can be achieved by a qualified worker as an average for a working day or shift, due allowance being made for the necessary time required for rest."

Levels of output which deviate from Standard Performance are usually expressed as percentages of SP. For example, if SP = 10 units per hour, and a worker's actual output was 8 units per hour, his rate of output would equal 80% SP. See Currie, R.M. 1972, p. 123.

3. This solution, in fact, seems to have been adopted by the DCM group, which reduced its product range last year (1976), and still witnessed a rise in sales. See The Guardian, 14/6/77.

4. Since these reports are confidential, they will be referred to by abbreviated titles. This first report will hereafter be referred to as the Survey Report (1971).

5. Currie, op. cit., p. 179.

6. Taylor, F.W. 1919; Shop Management in Taylor, F.W. 1947; See also Chapter 2.

7. See above, Chapter 2 on 'the one best way.'

8. See for instance Myers, C.S. 1932, Chap. 2; also Friedmann, G. 1955, pp. 53-4.

9. See above, Chaps. 3,4.

10. See above, Chap. 4, and also Gulowsen, 1972.

11. Results of Trial Application in the Assembly Dept., Consultants' report, 1972.

12. cf. Lawler, E.E. 1970; and see above Chap. 5, note 105, for criticism of this article.

13. Walker, C.R. & Guest, R.H. 1952, 'Conclusions.'

14. Interim Report. May, 1973

15. ibid. These increases are expressed against the assembly-line figures.

16. Wilkinson, A. 1971.

17. Klein, L. 1976.

18. See Anon. Doing their own thing at Meccano, 1975.

19. Conant, E.H. & Kilbridge, M.D. 1965.

20. Thornely, D.H. & Valentine, G. 1968.

21. Minutes of a union-management meeting at the Dairy, 30 Oct. 1970; Letter from the Co-op. Production Manager to the Dairy Manager, 21 Sept., 1971; Summary of Facts, Costs and Savings. Report by the Dairy Manager, n.d., (probably 1974).

22. ibid., Minutes.

23. ibid.

24. Letter from Dairy Manager to USDAW Area Organiser, 12 Oct. 1970.

25. Letter from Co-op. Personnel Manager to USDAW Area Organiser, n.d., probably 1971.

26. Summary of Facts, Costs,.....op. cit.

27. ibid.

28. cf. Blauner, R. 1964, Chaps. 6, 7.

29. Donaldson, L. 1975.

30. A Comparison of the Manufacturing Systems in Operation at the Castleford Plant of United Glass. Henley.

31. Donaldson, op. cit.

32. ibid.

33. op. cit.

34. Letter from Group Personnel Officer to the author, 9 Oct. 1975.

35. New Look Type Systems. Unpublished Doc. 1975.

36. Kelly, J.E. 1975.

37. Cass, K.G. Memo dated 10 Nov. 1975.

38. Kelly, J.E. Draft Report for Alloa. MS, 1975.

39. Donaldson, op. cit.

40. Letter from Group Personnel Officer to Alloa Factory Manager, 3 Dec. 1975; Letter from Group Personnel Officer to Personnel Director, 8 Oct. 1975.

41. Wilkinson, A. 1971; Klein, L. 1976.

42. Davis, L.E. 1972B.

43. The original proponent of these philosophical views, Douglas MacGregor, be it noted never adhered to such a crude theory of the determinants of managerial philosophy. In 1960 he wrote that:

> "The recession of 1957-58 ended a decade of experimentation with the "soft" managerial approach, and this assumption (theory X - JK) (which was never really abandoned) is being openly espoused once more."

This is a simple, yet remarkable observation into the bases of managerial ideology, and we shall explore its validity later in the thesis.

MacGregor, D. 1960, p. 34.

CHAPTER 10 THE MUTUAL INTERESTS OF WORKERS AND EMPLOYERS

In the Preface to Motivation to Work, Herzberg et al. wrote about the benefits of studying job attitudes:

> "To industry, the pay off for a study of job attitudes would be in increased productivity, decreased turnover, decreased absenteeism, and smoother working relations..... To the individual, an understanding of the forces that lead to improved morale would bring greater happiness and greater self-realisation." 1

In other words, as we have observed elsewhere (Chapters 1, 3, 4, 5) there is an asymmetry in the treatment of employer and worker benefits - the former derive economic benefits, the latter psychological. The asymmetry was underlined in a study of such a practice by Paul & Robertson. Writing of the job 'enrichment' studies at ICI, they posed the following question:

> "Can you enrich jobs without inevitably facing demands for higher pay or better conditions to match the new responsibilities?"

and answered unequivocally, "Yes," although they added a cautionary note against 'exploitation' by management.[2] Equally Hackman et al. have suggested that the 'personal and work outcomes' of job redesign would include motivation, reduced absenteeism and turnover, and better quality performance.[3] They did not mention economic benefits that might accrue to employees, although their model was explicitly limited to the direct consequences of redesign of jobs, and little has been said by them about the context in which this

occurs. Finally, we noted that reports of case studies in job redesign often separated 'economic' and 'human' outcomes, and tended, then, to equate the former with employer interests, and the latter with those of employees. The quotation from Herzberg illustrates the widely-held view among job redesign theorists and practitioners that in cases of job redesign, benefits accrue to both parties. In the introduction to the Work Research Unit report on British case studies, the authors actually listed the benefits which were said to have accrued to those involved.[4]

The root of the argument that both parties benefit from job redesign is to be found in the process of despecialisation of labour. This process is said to increase worker satisfaction and motivation and in addition, or as a consequence, worker performance. Now it is true that many case studies have reported improved employee attitudes, and improved performance, measured in terms of employee absenteeism, labour productivity, or unit costs. But we cannot assess what we might call the 'mutual benefits' thesis, the fourth proposition of job redesign theory discussed in the Introduction, unless we also consider the <u>costs</u> that are involved for both parties in securing their benefits. In addition we would also need to consider the duration of benefits and, if possible, to try and compare them against a common yardstick. And finally we would need to incorporate material on attitudinal changes, e.g. in job satisfaction (but see above Chapter 5). Because of the limitations of the available literature these latter

two tasks cannot be achieved, so we shall concentrate here on the costs of job redesign, firstly for workers.

(1) Job losses and employee displacement

When discussing the outcomes of job redesign, many authors of case studies have written from the standpoint of the workers whose jobs have been redesigned. They have frequently ignored however the consequences of 'enrichment' for other groups of workers both in the same plant, and elsewhere, yet these consequences are both real and significant. As we showed in the literature review two forms of job redesign, categories I and III,were particularly dependent on the elimination of labour in order to obtain productivity increases. Of all the known cases in the literature, where data was available on the displacement or elimination of workers, such displacement occurred in 68% of cases (see Table 1, Chapter 5). The displacement, or elimination of labour can thus be seen to be a significant phenomenon in job redesign, and as we saw in the literature review there was a relationship between the elimination of labour and the magnitude of productivity rises. The elimination of labour may take the form either of a reduction in the number of workers occupying a particular role, or roles, or the complete elimination both of a group of workers and of the roles they occupy. For example, in the study by McDavid, two clerical officers were eliminated, although the position of C.O. remained.[5] In the study by Walker,

35 setters and checkers were displaced, and their roles amalgamated with that of machine operative.[6] In a case reported by Ford three management personnel were eliminated after their duties had been delegated to sub-ordinates.[7] Rush described a case in which the job of frame cleaner in a textile mill was amalgamated with that of the operative, and 28 frame cleaners eliminated.[8] In the famous study by Weed at Texas Instruments, the cleaning force was cut from 120 to 71, whilst the volume of work remained approximately constant.[9] In a study by Emery & Thorsrud, the application of sociotechnical theory to the design of a new plant saved 38 jobs out of a projected 94.[10] The case study in the non-automatic weaving shed described by Rice saved 11 jobs.[11] The list could be extended much further than this, but the point has been made that labour elimination is indeed a pervasive, and, as was argued in Chapter 4, a necessary feature of job redesign. What, however is the magnitude of the phenomenon? How many jobs have been lost, and workers displaced in cases of job redesign? The following table shows both the numbers of jobs redesigned, and the numbers lost in cases of job redesign, divided by category.

TABLE 23 Job losses in cases of job redesign[12]

	Category I	Category II	Category III	Mixed Categories	Total
Jobs redesigned	349	223	1060	297	1929
Jobs lost	100	38	300	88	526
N (=number of cases)	13	16	18	5	52

Before discussing these figures, three general points must be made: firstly, the data have been combined from a series of studies carried out at different points in time, in different countries, and under different circumstances, such that the final figures take no account of variations in these or other factors. Secondly, cases where the numbers involved were unclear have been excluded, and thirdly, job losses due to simultaneous known mechanisation (which occurred in six cases) have also been excluded.

What the figures show, roughly speaking, is that for every 80 jobs redesigned, 20 have been lost. If the figures are correct this is certainly a 'cost' of some magnitude for workers as a whole. Let me now consider a number of possible objections to this evidence. Firstly, it could be argued that these job losses might have occurred in companies which were expanding, or in local labour markets where there was no shortage of alternative employment, so that the 'real' costs of job redesign may have been minimal. In some cases this was certainly the case, e.g. Walker,[13] but in others it seems unlikely, because of the numbers involved and the scope of the programme, that redundancies could have been avoided, e.g. Hepworth & Osbaldeston,[14] with presumably at least some of the problems which that process entails. But viewed from the standpoint of the economy as a whole, such an apparently effective eliminator of jobs, can hardly be considered a 'social benefit' unless countervailing mechanisms exist for the creation of an equivalent number and type of jobs in accessible labour markets.

Secondly, it might be argued that the data conflate losses due to job redesign and those due to other factors, e.g. mechanisation, declining markets etc. In other words, the data merely show a correlation between job redesign and job loss, not a causal relationship. The counter to this argument was presented, and illustrated, in Chapters 4, 6, 7 and 8 where it was shown theoretically, why job redesign necessitated elimination of labour (and hence of jobs, although the converse equation does not follow), and that we were not dealing therefore simply with a relationship of empirical association or contingency. I would, however, accept that the data may conceal some extraneous loss of jobs, and so the ratio of job redesign to job loss of 4 : 1, quoted above, should be taken as approximate, and subject to error.

Thirdly, it might be said that the kinds of job eliminated involved no costs for workers, but benefits, as many of them were supervisory or other authority roles whose elimination allowed workers to exercise more skill and autonomy. Whilst this may be the case in vertical role integration, it is very much less so in the other two types of redesign. In any case, whilst there may be benefits in some job elimination, this could arguably be mitigated if the process were associated with displacement of labour from the firm.

It is not part of my argument that job redesign always involves loss of jobs, and one of the tasks of future research in this area would be to investigate the conditions under which job losses do and do not occur. It was suggested,

for instance, they were less common in category II redesign (as the data above show), and that within category III redesign job loss was affected by the type of technology, and by the proximity of its output to operating capacity. Doubtless more hypotheses will be advanced in the future.

The number of workers displaced is lower than the number of jobs eliminated because in the latter category has been included three cases where jobs were 'saved,' but no labour displaced as none was then employed. These savings were calculated against theoretical manning levels predicated on traditional divisions of labour and systems of control. The revised operating levels were set on the basis of flexible work groups. As noted already we have very little information on the fate of displaced workers, although we know that in some cases they were found jobs elsewhere in the factory. Unfortunately again, this information has rarely been accompanied by more precise data on the types of alternative work found.

It may also be of interest to notice that the rate of elimination of jobs appears to have been greater in the U.S.A. than in the U.K., as the following figures show:

TABLE 24 Job redesign and job losses in the UK and USA[15]

	USA	UK
Jobs redesigned	560	354
Jobs eliminated	220	10
N (= number of cases)	18	16

The reasons for this international difference are unclear although one could suggest plausible hypotheses, such as differential union densities, which it would be fruitful to examine more carefully.

It should be said that the phenomenon and the scale of job loss may be peculiar to an economy, or an industry, in which labour is regarded as an economic cost that ought, where possible, to be minimised. Under different economic and political arrangements, it is therefore conceivable that job redesign (if it were practised) would not be accompanied by job losses, as reported above.

A number of writers have suggested displacement of workers may be a consequence of job redesign (see Chapter 5) but although this suggestion has now been vindicated there was before now very little direct and systematic evidence available.

(2) Wage/salary rises

It has been argued in Chapter 5 that the withholding of wage and salary increases from employees experiencing job redesign was not a necessary, but a contingent, feature of job redesign. It would, in other words, be possible for wage and salary increases to be granted without any violation of the principles of any job redesign theories. The incidence of pay rises was shown in Table 1 (Chapter 5) to be approximately 60-65% of all cases of job redesign. Cases where workers did not receive pay rises are well known, and

include some of the Philips studies, cases reported in Rush, the ICI studies, and the case of AT & T, described by Ford. In these cases the wage-effort ratio has been tipped in favour of management as wage costs per unit output have been reduced.

We can also consider the question of wages from the standpoint of the relation between labour and capital in a particular plant as a whole, for although wages might rise, so too does productivity. It is therefore possible, as happened in one of the earliest job redesign exercises at IBM, for wages to rise, and labour <u>costs</u> to fall.[16] In other words the total share of the wealth produced in the plant which went to labour showed a decline, whilst that accruing to other parties - landowners, bankers, retailers, employers, shareholders etc. - showed an increase. Even if employees <u>do</u> receive wage increases then, they may not be commensurate with the increased profits accruing to the employers, and others, as a result of improved productivity.

<u>(3) Labour intensification</u>

It was established in Chapters 6,7, and 8, that two forms of job redesign involved the performance of additional duties during the working day, either as part of an expanded individual role (category I) or as part of a flexible work group (category III). From the standpoint of raising labour productivity this strategy was evaluated in a negative sense

compared to the use of more efficient methods of working or the installation of new machinery. Neither of these latter methods need involve an increase in human effort (see Chapter 11).

But from the standpoint of the individual, matters may appear differently: an objective increase in daily effort expenditure may be perceived or experienced as effort reduction, or less dramatically, as comprising no effort increase at all. On the other hand, it may be perceived as effort increase, but accepted nevertheless, for a variety of reasons. One should also bear in mind the phenomenon of habituation.[17] This phenomenon indeed was evidenced in the study by Rice, of the reorganisation of an Indian textile mill:

> "At the first conference there were many complaints of tiredness caused by so much extra walking. By the second, there were reluctant admissions by some workers that they were getting used to it. By the third, they showed a preference for the new methods of work. At all conferences they said that they worked much harder than in the other sheds." 18

So on the one hand we find the phenomenon of habituation, on the other a continued, cognitive, appreciation of increased effort expenditure. In a case of category I redesign, described by Guest, it was noted that,

> "When the change was made, the girls at first thought they couldn't do half of the work..... After a while not only did they find they could handle the work load but there was even some idle time,....." 19

One factor which may contribute to a changed perception of increased effort expenditure is the perceived locus of control. Work at an individual work station may be felt to require less effort, despite increased physical output,

because the worker can pace himself and no longer has to suffer the strain of assembly line pacing. Unfortunately this issue is by no means as simple as might at first appear. For one thing it is far from self-evident that paced assembly line work is ipso facto stressful, but more likely that this depends on the pace of the line and the operator's ability to adhere to the pace. The complexity of the issue can be illustrated empirically:

> "When operators in straight-line assembly switch places with pre-assembly operatives, it is felt that the pre-assembly jobs are better because they are freer. Even though the balance of task cycles is the same, and the work therefore requires the same overall pace in pre-assembly as in main assembly, the pre-assembly jobs lack the close link to the process created by the transport carriers in the main assembly." 20

This observation came from a report on the Volvo-Kalmar plant, in Sweden, and a similar comment was made by many employees involved in a transition to individual assembly in the Philips Company, in Holland. [21]

On the other hand another case of category II redesign, again within the Philips Company, yielded a rather different finding. After the introduction of unit (individual) assembly, workers were asked a series of questions, one of which concerned the felt pressure of work and whether this bothered the workers. 23% of assembly line workers said they <u>were</u> bothered by too much pressure, but the figure for unit assembly workers was 40%![22] The difference however was statistically non-significant. Again, in a similar case, reported by Conant & Kilbridge, 48 out of 61 workers expressed a liking for individual (bench) work on the grounds that it

allowed self-pacing, but at the same time, 24 of these workers also expressed a liking for paced assembly line work.[23] In other words, at least 11 workers liked both self pacing and mechanised pacing.

One explanation for these 'contradictory' attitudes may lie, as already suggested, in the actual pace of assembly line work. In other words the onerousness of external pacing may come into being only when the pace itself is intensive. This was probably the case at the Kalmar plant, where workloads were set at 111% of standard, as determined by the use of MTM.[24] It should also be borne in mind that individual working and 'self pacing' may be coercive, and that mechanised pacing on assembly lines is not the only source of strain at work. Workers in the Conant & Kilbridge study for instance complained about the wage-effort ratio on bench work, alleging that the piece rates were tight and that it was easier to make one's earnings level on the line. Finally, the pacing of assembly line work may have its own satisfactions, as Baldamus,[25] and Turner & Miclette,[26] have demonstrated, so that even highly-paced work may be tolerated because of its properties of 'traction.'

Increased intensity of work may thus be counteracted psychologically in at least two ways, both of which might reduce the element of cost within it. The first way requires recognition of the fact that employees may 'trade-off' higher intensity levels for greater control over work,

the second is that more intense work may simultaneously involve greater elements of 'traction' (as was in fact suggested in Chapter 8).

In summary then, we may say that perceptions of labour intensification need not correlate with actual increases in intensity, for the reasons indicated above. Labour intensification, although objectively a feature of at least two categories of job redesign, may not be experienced as such, or may be recognised but not felt as onerous because of the results of habituation or traction.

(4) Managerial control and worker accountability

In several cases of category I and II redesign the authors reported improvements in product quality, which they attributed to the concession of responsibility for quality, and sometimes quality testing to directly productive workers. It was indicated however that the effect of category II redesign was to isolate employees and render worker accountability much easier. As Guest wrote of one case,

> "When quality errors were made it became much easier to identify who made the error." 27

and more generally, Sirota argued that this individualisation of work roles, with its consequent augmentation of accountability, was an objective, and a feature of traditional, 'hard' management practice.[28] In a number of cases the heightened accountability of workers was both formalised and intensified by means of the device of personal worker signatures on products.

Since it is difficult to measure accountability, and worker control over pace and quality, in any meaningful way, it is difficult to compare these two aspects of category II redesign (and some cases of category I) and arrive at an overall assessment of the net degree of control (or autonomy, perhaps) acquired or lost by workers in these cases. All one can say therefore is that workers may pay a price for their 'autonomy' in the form of increased control over and accountability of their performance by management, as has also been argued by certain other writers (see Chapter 5).

Costs to management

The costs to management of job redesign are much harder to specify because their role and presence in job redesign is more peripheral than that of the workers directly affected. Any overall assessment of these costs must therefore be only tentative and provisional. Economically, the costs would seem to be minimal, since no major investment is typically required. Even if consultants' fees and management time are costed, these will generally be weighed against, and paid out of, the long run increase in labour productivity which the consultants and management have jointly engineered. Thus the authors of case studies at Philips, Meccano, BSC and ICI estimated that this cost would be recuperated within a few years of the project's initiation.[29] Increases in wages have often accompanied job redesign, but with corresponding increases in labour productivity, the net effect has invariably been to

reduce either total labour costs per annum or unit costs of production or both, as several writers have pointed out.

On the other hand, there may be significant costs associated with particular forms of job design. Reorganisation of flow lines may entail the construction of individual work stations, and result in higher levels of stock to cope with improved materials supplies. Figures for these and other costs were provided by Persson[30] in an assessment of job redesign at Saab-Scania, but he concluded that they were balanced by the estimated savings due to reductions in absenteeism, labour turnover and other costs.

If there are any significant costs of job redesign for management they are likely to be found in the social, or political, sphere. In category II redesign, a typical innovation is the transition from a progressive flow line to individual assembly. On the flow line the pace of work may be at the discretion of management and mediated via the speed of the mechanised line. Alternatively, on non-mechanised lines, faster workers may be placed at the head, and slower workers at the rear of the line, to facilitate maximum production. These mechanisms of control disappear under individual assembly, and although alternative systems may be brought into play, e.g. use of individual cash incentives, or greater responsibilities assigned to supervisors, they may not be as effective. These alternatives appeared to be effective in the case of Meccano, discussed in Chapter 9, but other situations may yield different outcomes. Again,

in cases of category III redesign, workers are often assigned control over labour allocation within a delimited area. Whilst there is no evidence that this concession of control has ever seriously backfired against management, the fact that control over this issue formally rests with the workers indicates that such an eventuality is a theoretical possibility.

Such data as we have included here was derived from cases defined as successful, but in those where expected results did not materialise, then the costs of management and consultants' time, etc., may not be recouped. The bias of the literature towards successful studies prevents any serious evaluation of failures, and hence, of the net costs to management of such schemes. What is also not clear from the foregoing is why job redesign has not been conducted more extensively if the benefits are so good, and the costs so low. Whilst one can point to a number of factors here - lack of opportunity, workers' disinterest, union opposition, managerial conservatism etc., there is no satisfactory explanation of the assumed indifference to job redesign on the part of British, and perhaps to a lesser degree, US managers.

All we can say in summary is that the economic costs of job redesign for management appear to be minimal, compared to their usual incomes, and that the political costs constitute a theoretical possibility but one not yet realised.

Summary and conclusions

Five main conclusions may be drawn from the analysis in this Chapter, bearing in mind the caveats noted above. Firstly,

it seems there are several economic costs of job redesign both for the workers directly affected, as well as for workers in ancillary and nearby work roles. Secondly, the costs of redesign for management would appear relatively speaking, to be much less. Thirdly, when one combines these first two conclusions, and bears in mind also the fact that managements have benefitted economically from job redesign more often than workers have benefitted economically, or psychologically, then we are justified in concluding that the overall costs and benefits of job redesign have been unequally distributed to the benefit of employers and to the detriment of their workers. Fourthly, in arriving at this conclusion we have had to effect a methodological innovation and consider job redesign not only from the point of view of those whose jobs are 'enriched,' but also from the standpoint of those whose jobs have been eliminated. Fifthly, we may regard the sixth proposition of our theory, on the non-mutuality of interest satisfaction in job redesign, as having been vindicated (insofar as that is possible given the strict, non-comparability of psychological and economic data.)

NOTES AND REFERENCES

1. Herzberg, F. et al. 1959, p. ix.

2. Paul, W.P. & Robertson, K. 1969, p. 54.

3. Hackman, J. & Oldham, G. 1974B, pp. 12-13.

4. Butteriss, M. & Murdoch, R. 1975.

5. McDavid, I. 1975 , Case IV.

6. Walker, C.R. 1950.

7. Ford, R.N. 1969.

8. Rush, H. 1971.

9. Weed, E.D. Jr. 1971.

10. Emery, F.E. & Thorsrud, E. Chap. 6.

11. Rice, A.K. 1958

12. On the index of cases given at the ends of Chaps. 6,7 and 8, the cases included in the Table are as follows:

    1,2, 12, 16, 22, 23, 26, 38, 42-5, 56, 60, 61, 63-5, 67, 71, 78, 79, 82, 90, 93, 100, 106, 107, 109, 115, 117, 119, 120, 121, 125, 128, 131, 132, 136, 137, 140, 144, 151, 159, 160, 164, 174, 180-2, 185, 191.
    These are all the cases on which data on labour volume is available, whether labour was eliminated or not.

13. Walker, op. cit.

14. Hepworth, A. & Osbaldeston, M. Nov. 1975B.

15. Case numbers are as follows: 2, 12, 16, 22, 23, 26, 42-5, 60, 61, 63-5, 67, 71, 78, 79, 82, 90, 100, 106, 107, 115, 120, 136, 137, 140, 159, 164, 180, 182, 191.

16. Walker, C. op. cit.

17. For a recent treatment of habituation, see Hackworth, J.F. 1969.

18. Rice, 1958, pp. 148-9.

19. Guest, R.H. 1957, p. 14.

20. Aguren, S. et al. 1976, p. 21.

21. cf. den Hertog, F. 1974. Cases 4.1, 4.2.

22. Thornely, D.H. & Valentine, G.A. 1968.

23. Conant, E.H. & Kilbridge, M.D. 1965.

24. cf. Aguren, S. et al., op. cit., pp. 10, 19, 25 et seq.,; Lindholm, R. & Norstedt, J.P. 1975, pp. 73-4.

25. Baldamus, W. 1961, Pt. II

26. Turner, A.N. & Miclette, A.L. 1962.

27. Guest, R.H. op. cit., p. 13.

28. Sirota, D. 1973.

29. For BSC see Bilston Finishing and Dispatch Dept.: Report of Development Group. London BSC, 1975, p. 11; for Meccano, Survey Report. 1971; for Philips, den Hertog, op. cit.; for ICI, Roeber, J. 1975, Chap. 13.

30. Persson, T. 1978.

Part Four

DISCUSSION

CHAPTER 11 PROBLEMS OF THE NEW THEORY

Status of the new theory of job redesign

Having examined the new theory of job redesign in the light of each of the three categories of job redesign and of the case studies, we must now consider the status of the theory as a whole, and the relations between its constituent parts. It will be recalled that the theory contained six main postulates, viz.

(i) job redesign could be seen generally, as a form of intensification of labour,

(ii) it emerged partly in response to inefficiencies in production,

(iii) it cannot be said to have 'abandoned' scientific management,

(iv) performance improvements could be attributed to the operation of - pay rises and incentives, work methods improvements, labour elimination, and enhanced accountability, although a minority of cases might be accounted for by the clasical theories of job redesign,

(v) employee performance and attitudes were analytically dissociated,

(vi) it entails, for workers, the costs of increased effort expenditure and loss of jobs.

Let us examine each of these postulates in turn.

(i) The characterisation of job redesign as intensification of labour depends in part on the concept of 'labour intensity,' and this will be discussed in more depth in a later section. For the moment however let us confine our attention to the literature review and the case studies and to the definition of the term as the degree of effort expenditure in the working day. Our question then becomes, "Does successful job redesign necessarily entail increased expenditure of effort?" The prefix 'successful' is needed only to ensure that we are discussing cases of actual job changes, in which there have been actual improvements in job performance.

Three forms of evidence were adduced in support of this postulate: the first was evidence on the elimination of labour from a production process. The argument here was that if the same volume of output was produced by fewer workers after job redesign then, ceteris paribus, each individual worker must be producing a greater output, and doing so by means of increased effort expenditure. The argument turns of course, on the validity of the 'other things equal' clause. In a very small number of cases, perhaps 5-6, new machinery, or plant, was involved, and it is possible this alone might have accounted for most or even all of the improvements in job performance. In cases of flow line reorganisation, improvements in work methods, in the form of reduced or eliminated non-productive time, were an integral feature, and again it was possible that performance improvements occurred here in the absence of increased effort expenditure. Empirically however this was found not to be the case. In

those cases where detailed information was available, methods improvements alone accounted for up to 70%, but no more, of productivity increases. Equally, we saw in the Meccano case study that increased effort expenditure occurred over and above the improvements in working methods.

Secondly, it was argued that in vertical role integration, workers took on additional work roles which supplemented their existing jobs. Again, so long as performance of the old job role remained at least constant, job redesign here entailed enhanced effort expenditure.

Thirdly, evidence was adduced directly from workers themselves, about levels of effort. In the cases reviewed in Chapter 4, as part of the analysis of sociotechnical systems theory, many comments about increased effort levels were noted. And again, in cases of category II redesign, similar attitude findings were reported.

These three sets of data, taken together, provide confirmation for the view of job redesign as intensification of labour, and we shall say more on this concept in a subsequent section of this chapter.

(ii) The origins of job redesign exercises were treated most extensively in Chapter 5, where it was argued that surveys of firms had shown a preponderance of production problems in the genesis of redesign. However, as the United Glass case indicated very clearly there are problems of interpretation with these findings. The dominance of 'production' problems might simply reflect the particular views of the managers

who responded to the questionnaires in the surveys, such that a selection of different managerial specialists would generate different results. Equally, it cannot be assumed that because different people label problems in a different way, that they are talking about different phenomena. The fact that people quit their jobs at a high rate may variously be construed as a problem of low morale, of unstable production, or of high training and labour costs. Conversly, the use of the same term, e.g. rising labour costs, may indicate quite different problems in different cases, e.g. poor organisation and allocation of work, strong trade unions, or bad pricing policy.

Although the evidence from surveys, principally, as well as from the cases in the previous chapter, suggests the preponderance of inefficiencies in production rather than absenteeism or turnover, as linked with job redesign exercises, the problems cited above must be borne in mind, and such a conclusion regarded as tentative.

It should also be noticed that we have written only of a tendency, albeit a strong one, and that certain cases may be initiated for more conventional 'personnel' reasons, such as absenteeism. Equally, it should be noted that a small number of companies, such as I.C.I., have ostensibly initiated experiments in job redesign for purely 'experimental' reasons. Whilst there is no reason to believe cases of this type to be widespread, they do require further investigation, to discover whether there were in fact origins in certain

problems, or if not, to assess the conditions under which such initiatives might occur.

(iii) It was argued that job redesign had not abandoned scientific management to the extent that it employed financial incentives, improvements in work methods, individualisation of work roles and enhanced accountability. There would seem to be no doubt about the actual use of any of these mechanisms, and so the argument here hinges on two points: firstly, on the assumption that these mechanisms are in fact pertinent, and not extraneous, to job redesign; and secondly, that the conception of scientific management advanced in Chapter 2 is a valid one. The first point will be dealt with under item (iv) below, so let us turn to the second point. Many of the conceivable objections to my account of Taylorism were considered in the relevant chapter, and it would be out of place to repeat them here. One of the principal themes however was that Taylorism did not entail enhanced division of labour, an argument which would seem at the very least to be contentious. That the mechanisms itemised above were historically part of Taylorist practice would, on the other hand, appear to be undoubtedly correct. Again the point of contention is whether their use today signifies the continuation of Taylorist practice, or whether Taylorism has perhaps been defined too broadly in the earlier chapter.

(iv) Much of the analysis of cases, in the literature review, and in the previous chapter, was devoted to an

examination of the utility of the theory of job redesign advanced in the thesis, and in particular to the mechanisms of performance improvement which it postulates. How adequately then do these mechanisms account for the performance improvements? The theory would seem to have more applicability to categories II and III than to category I. In category II we found evidence for the efficacy of work methods improvements, and a reasonably widespread provision of pay rises and incentives, although in a number of cases data was unavailable on pay levels and systems. And for improvements in product quality, it was noted that this category of redesign individualised work roles and hence increased the ease with which workers could be held accountable for their efforts.

In category III, elimination of labour and provision of pay rises and incentives were widespread and seemed to offer at least part (and probably a large one) of the explanation for productivity improvements. In the case of quality improvements, the absence of reliable data rendered explanation difficult, but the use of quality bonuses was noted in several cases.

Evidence for the existence of these four mechanisms was much less in category I, although they did exist, especially in cases involving blue collar workers. For white collar workers however, it would seem that one or more of the classical theories of job redesign could offer a more adequate account.

The literature review and the case studies suggested however that these mechanisms in themselves may not be adequate. The relationship, for instance, between pay and performance may not be so direct as I have suggested and may be affected by a range of individual differences in attitude and personality. The available data did not however permit any examination of these kinds of issues, but merely pointed in their direction. The findings on the efficacy of pay rises were not totally convincing, at a general level, despite their plausibility in particular cases. One explanation for this may be that more intrinsically motivated employees tend not to receive pay rises, but still to improve their performance as much as those receiving extrinsic rewards in other cases, thereby masking the general effects of pay. Equally, it was not clear from the cases and literature review precisely how labour elimination succeeded in raising productivity. Its empirical association with pay rises would tend to suggest that employers may 'buy out' jobs in many cases. But it is also possible to draw on the work of Umstot et al. and suggest that after labour elimination workers may be assigned higher goals of performance.[1] In other words some of the insights of Locke's goal setting theory may need to be utilised here.

There is also some evidence to suggest that these mechanisms may not be empirically independent, as an association was found between labour elimination and provision of pay rises. One possible explanation for this is that

workers may accept reductions in the labour force only if those remaining are compensated with wage rises. Equally, there was found a (lesser) empirical association between the use of methods improvements (in category II redesign) and the provision of pay rises via financial incentives, and an explanation for this association was suggested in the Meccano case study. The use of improved work methods resulted in the more efficient use of existing levels of effort expenditure such that higher output was obtained. But the rate of performance remained approximately constant, and the Meccano management was not satisfied with the resultant level of output. They wanted both to increase the efficiency of effort expenditure as well as its absolute level, and for the latter objective pay rises and incentives were deemed essential. In cases however where performance levels are already high, pay rises and incentives may play a minor, even a negligible role, in the genesis of productivity increases.

The fourth mechanism postulated - enhanced accountability - would appear to operate independently of labour elimination and pay, but to be related, at least theoretically, to work methods improvements. This is because such improvements were analysed as being a consequence of the reduction of work role interdependencies, or to put it another way, of increased individualisation of roles. This strategy served to reduce,

or eliminate, time spent in product handling, as well as some portion of waiting time. But by the same token it rendered more visible, and more accountable, the activities and efforts of any particular worker - hence the theoretical relationship between these two mechanisms.

(v) In all three categories of job redesign we found examples of job performance - job attitude dissociations. There were cases where attitudes improved, whilst performance was constant; of performance improvements with attitudes constant; and even of attitude improvements with performance decrements. The fact that such dissociations occurred in all three categories suggests that the phenomenon is not specific to a particular type of change, or of industry, but is more pervasive and more general in character. And it may be seen as confirming the view that the normal attitude-performance association masks the equally normal operation of twin mechanisms. As argued above this view is also in accordance with the generally low attitude-performance correlations found in non-change situations.

There is however one difficulty with this argument, which should be addressed, and that is the generic use of the term 'job attitudes.' In practice, I have used this term in three, conceptually very distinct ways. The first was to refer to satisfaction with one's job, and this has been, in fact, the most common usage. Job redesign theorists have argued that one of the personal outcomes of the performance of intrinsically-motivating jobs is increased

satisfaction with one's job. It has been shown however that this is not a necessary consequence of successful job redesign, and that it cannot therefore be seen as conceptually related to job performance, either as a consequence, or as its cause. If one assumes (for the moment) that job performance is a function of job motivation, then what is being suggested here also is that job motivation and satisfaction are conceptually and empirically distinct. High motivation need not result in satisfaction and vica versa. But insofar as performance is not exclusively a function of motivation, but also of ability, opportunity, control systems and so on, then this motivation-satisfaction distinction should be treated with more circumspection than the performance-satisfaction difference.

The second usage of the term 'job attitudes' has been to denote perceptions of one's job, and in particular of job content. The task design theory of Hackman et al., assigns a crucial role to perceptions of job content in the genesis of motivated job performance, and to the extent that performance changes may occur in the absence of perceptual changes, then the Hackman et al. theory is in difficulties. Several studies of job redesign, e.g. Archer,[2] Paul & Robertson,[3] have employed the Job Reaction Survey to measure employee perceptions of job content, and of its psychological implications. This survey was designed to test Herzberg's theory of job 'enrichment,' but some of the items refer to features of jobs, such as feedback, task significance and

autonomy, which were also cited as relevant by Hackman et al. The results showed that performance increments occurred in the absence of job perception changes in some cases. Since the J.R.S. does not measure all five dimensions specified by Hackman et al. these findings cannot be taken as incisively refuting their model. But Hackman et al. have also suggested that changes are necessary on each of the three major clusters - autonomy/feedback/skill variety, task identity and significance - and that being so then the results of these cases certainly raise doubts about the validity of the model.[4]

The third usage of the term 'job attitudes' has been to refer to 'intrinsic motivation,' i.e. motivation to perform arising out of the intrinsic features of a job such as variety, autonomy and responsibility. This was assessed directly in only two studies, those by van Gils,[5] and by Rush,[6] both of which involved white collar workers. Unfortunately no data was available on the content of the questionnaires used in these studies so comments cannot easily be passed on the results obtained. All that should be said is that the results were in fact more pertinent to the third proposition in our theory, on the significance of what has been called extrinsic motivation.

If we take them at face value then they do suggest that performance improvements can be obtained in the absence of changes in intrinsic motivation (as in the Rush study), but the absence of information relating to pay levels and systems prohibits any more positive conclusions on this point.

In summary then, it should be said that although the empirical occurence of attitude-behaviour discrepancies has been reasonably shown, the dual-mechanisms hypothesis put forward to account for them has not, in fact, been tested.

(vi) On the basis of the evidence and arguments in support of propositions (ii), and (iii) above, the sixth and final proposition follows as a matter of course. In other words, if labour elimination is one mechanism of job redesign, then the result of this must be loss of jobs on the one hand, and higher effort levels on the other, again, other things being equal. The previous chapter explored some of the negative consequences for workers of job redesign in detail and did indeed confirm the existence and pervasiveness of job losses as a consequence of job redesign.

In categories I and III in particular, both the empirical incidence of labour elimination as well as its theoretical necessity, under certain conditions, would incline the author to the view that this phenomenon is indeed an integral feature of job redesign generally speaking, as the theory posits.

* * *

Let me now turn to consider some of the more general problems and limitations of the theory that has been advanced. There are two major limitations to the theory which should be noted initially. Firstly, whereas the conventional theories of job redesign seek to explain changes in job performance, job attitudes, turnover, absenteeism, and (sometimes) strikes, the present theory has embarked on a far less ambitious project, and confined itself to job performance, and to a much lesser degree, job attitudes. It has not, in other words, addressed itself to the phenomena of absenteeism and turnover, and insofar as these may be regarded as indices of morale, then the reader is entitled to an explanation for such omissions. The reasons for them are threefold: a) the complexity of performance, and attitudes, seemed a sufficient challenge in its own right and there was literally neither time nor space to accomodate these other phenomena; b) it seemed to me that the phenomena of performance and attitudes were more central to theories of job redesign than those which I omitted (although some people might disagree with this); but, c) there is evidence to suggest that the link between turnover and absence on the one hand, and morale on the other, may not be as close as has commonly been thought.[7] Indeed it has been suggested that turnover and absence may themselves not be closely related under all conditions.

Nevertheless I would accept that since changes in absence and turnover levels have been reported in some cases

of job redesign, any theory of this field must offer some explanation of why this has occurred. And since the present theory does not offer such an account it must therefore be regarded as limited in its scope.

Its second limitation pertains to the conditions under which the theory holds, and to the circumstances or contingencies whose variation may affect the theory's applicability. Some limitations and contingencies were suggested, as for example, that intrinsically-motivated employees may fall outside of the ambit of the theory, or in the argument that the necessity of labour elimination under category III redesign may vary with the type of technology, and the degree of influence on production afforded to labour. The fact remains however that no systematic attempt was undertaken to assess the influence of product and labour markets, technology, industry, industrial relations, organisation size, and the many other variables which might be thought worthy of exploration.[8] In part again this was a problem of time limits, but also, and more seriously, of weaknesses inherent in the existing data, and it may well be that the theory's applicability is both more limited in its scope and contingent in character than I have suggested.

The next problem is methodological in character and properly belongs in the next section, although it will be mentioned briefly here. The thrust of the argument in the literature review was that the new theory of job redesign

offered a more plausible and a more adequate account of case study outcomes than the conventional theories, and that, in addition, it was able to cope with problems such as attitude-performance discrepancies. Nevertheless, apart from the Meccano case study (with which there were numerous problems), no direct test of the theory was available in the literature. The alleged validity of the new theory rested on its plausibility as much as on any experimental 'proof,' and this is clearly a weakness in the overall thesis.

The next issue for consideration is the question of attitudes. The fifth postulate of the new theory stated there would be empirical dissociations between job attitudes and behaviours, and that these were due to the operation of dual mechanisms: one governing attitudes, the other behaviours (although some overlap was recognised). The data presented in the previous chapters amply confirmed the empirical aspect of the postulate, but they did not provide much evidence on the nature of the respective mechanisms (if they do indeed exist).

Theoretically, the principal reason for this omission lay in the fact that the new theory failed to indicate, in detail, the mechanisms 'controlling' attitudes (as it did with job behaviour), other than to suggest they were broader in scope than those governing behaviour. Clearly this is an area requiring considerably more theoretical and empirical work if the dual-mechanism thesis is to be

tested, and if the new theory of job redesign as a whole is to be evaluated.

Finally, we must discuss a number of conceptual and theoretical problems, the first of which concerns the usage of the category 'white collar employee.' It was argued that the theory advanced here enjoyed less applicability to white collar as compared with blue collar workers. Yet it is surely the case that the category of 'white collar' workers is extremely misleading, and conducive to oversimplification, if it is taken to imply some not inconsiderable degree of homogeneity. For 'white collar' work may embrace anything from filing letters all day through to decision-making at the highest levels of an international corporation. And white collar workers may receive anywhere between a few hours and eight years training, and have qualifications (in England) from "nothing" up to two or more degrees. In terms of job attitudes, lower grade white collars with few qualifications may be much closer to blue collar workers than to their more senior counterparts, but this remark raises another problem.

The 'blue collar' worker is also very far from being a simple, and a single type. There is an enormous range of 'blue collar' occupations from floor sweeping through to tool making, and there is no *à priori* reason to suppose a striking similarity of attitudes to work among such groups. Future research in this field would therefore need

to specify the applicability of the theory in terms of patterns of job attitudes, qualifications, and job content (and perhaps other variables) and thus move away from a simplistic blue-white collar dichotomy as employed here.

The second conceptual problem with the thesis concerns the sharp distinction drawn between intrinsic and extrinsic motivational mechanisms. It should perhaps be pointed out that we did not distinguish two such forms of job attitude, or orientation to work, for it was argued that job performance and job attitudes were analytically separate. This implies that any combination of job attitudes (in intrinsic-extrinsic terms) is possible. Nevertheless the possibility that intrinsic motivation (in response to 'enriched' job content) may co-exist with, or indeed conceal, a concern for economic rewards was not seriously considered.[9] Conversely, the idea that pay rises may be valued for symbolic, or intrinsic, reasons, was accorded equally scant treatment. These omissions were justified, I feel, insofar as they allowed some simplification of the issues, and thus permitted more incisive analyses to be conducted. But the price of these explanatory advances was a degree of theoretical crudity. Certainly, such issues as the above require investigation if the validity of the new theory is to be properly tested, but such tests could not be conducted on the basis of the existing data, which would be wholly inadequate for such purposes. Fresh, and more rigorous studies would need to be conducted.

Finally, we should mention the concept of accountability, as used in our theory. Evidence for enhanced accountability, particularly in category II redesign, was presented in two forms: firstly, it was argued that work role individualisation created the possibility of increased accountability, which it was assumed management would exercise (and that assumption may not, of course, be universally valid); and secondly, it was shown in the Thornely & Valentine case that workers actually perceived this to be the case, and felt that errors in their work could more easily be detected.[10] No other empirical evidence was available on workers' perceptions, although interpretations of the sort advanced above were also to be found in other writers. Nevertheless it would be desirable, as well as necessary, to conduct more detailed investigations into this issue.

Some of the problems raised in this section have serious implications for the validity of the theory, and indeed for the utility of the 'tests' to which it has been subjected in this thesis. Before passing some final comments on the theory, I shall therefore consider three areas of difficulty in more detail in the ensuing sections. The first covers what may broadly be termed methodological problems, some of which have been raised indirectly in earlier discussions of the limitations of the current literature and of the case studies described in the previous chapter. Such problems must be articulated more precisely if a balanced assessment

of the new theory is to be reached. The second area is that of motivation. This term has barely been defined, let alone discussed throughout the thesis, and I have concentrated instead on testing the utility of a quasi-Taylorist conception of the term. There has, however, been a considerable volume of debate within industrial psychology on the nature, and meaning, of this concept, and some of these issues and themes must now be confronted.

The final area relates, again, to a conceptual lacuna in the thesis. The concept in question is that of effort, and the corollary notions of 'intensity' and 'intensification' of effort. Very cursory definitions of these terms have been employed throughout, but their unsatisfactoriness must surely be apparent. The final section, therefore, explores in more detail the precise meanings of each of these terms.

Methodological problems

The first section of Chapter 6 examined, and tried to assess the impact of, a variety of methodological deficiencies in the job redesign literature. Some of these must be restated and their implications re-emphasised here, and we must also consider some of the problems attendant on the alternative interpretations that were proposed.

In concentrating on Taylorist theory, as contained in Taylor's major publications, we ran the risk of painting a rather one-sided picture of scientific management, as some of Taylor's works were written to placate and to reassure hostile audiences. Whilst I do not believe that a misreading of his work has been presented in this thesis, further research would be required to confirm or disconfirm such a possibility.

The next main problem concerns the theory of job redesign proposed in Chapter 5. Two of the main postulates of this theory were that job attitudes and job performance, were influenced, to a considerable degree, by different mechanisms; and that the mechanisms involved in the improvement of productivity and product quality under job redesign were pay incentives, labour elimination, work methods improvements and accountability and control. For the purposes of testing these notions against the literature it was sufficient to provide 'working definitions,' but more profound problems must now be examined. It can be stated quite firmly that both of these postulates are tremendous over-simplifications of what are, undoubtedly, very complex phenomena. As Lawler [11] has pointed out, there is a consistent, though small, correlation between job satisfaction and job performance and he has chosen to stress this consistency, rather than the small magnitude of the correlations. Equally, it has been demonstrated by Marriott that the effectiveness of incentive payments is both difficult to assess, and may be situation-

specific.[12] I chose, in the literaure review to ignore many of these problems, and to assume the effectiveness of incentives whenever a correlation between pay rises and productivity increases was shown to exist. The justification for this apparent theoretical naivete was in fact methodological, for the aim of the review was, as far as that was possible, to test null hypotheses against the available data, and to explore the explanatory power of the postulated theory. A review of that sort could logically show only, for instance, that certain alternative theoretical interpretations of the available cases were more plausible than those offered by classical job redesign theory. This type of argument is admittedly weak, but this weakness reflects, to a large degree, the deficiencies in the current and available literature that were noted at the beginning of Chapter 6.

It might be objected that a thorough and well conducted case study could surely overcome many of these deficiencies and allow one to draw much firmer conclusions. But this would not be so, for although the Meccano case study did offer some interesting insights into the operation of a particular scheme of job redesign, it is always difficult to judge how far such insights can be generalised beyond their origin, or how far they are limited and peculiar to that particular situation. Any one of a whole number of features - of the labour force, the management, payment system, technology, local culture etc., could seriously curtail the generalisability of any conclusions drawn, no

matter how firm. A literature review, with all its deficiencies, therefore played an important role in this thesis.

Of course, many of the cases used in the literature review contained serious shortcomings, noted already. There may have been simultaneous changes within the company that went entirely unreported, or indeed even unnoticed. King has shown for example that managerial expectations of higher performance, transmitted to supervisors, may be more potent determinants of productivity increases than actual changes in job content.[13] In other words the mechanisms of job 'enlargement' (as he called it) may not be employee motivation, but supervisor motivation. Marriott has argued a similar point with regard to incentive pay systems: although they can be shown to be effective, in raising output, reducing costs etc., this tells us nothing about the mechanisms involved.[14] The idea that they operate via employee needs, as incentives, is one possible theory, but that is all. It may equally be the case that insofar as incentive schemes tend to raise total labour costs they act as an incentive to management to organise production more efficiently. Because of the deficiencies in the literature we cannot say, generally, how important may be the expectations of management, but we can, and did, show in a particular case (Meccano) that managerial expectations did result in a strengthening of supervisory interventions

in production, and thus in an increase in productivity. The operation of such expectations, and their translation into action, may therefore be an important variable for understanding job redesign as may the effects of other 'extraneous' variables. And Cummings et al. have suggested that a more careful examination of cases in the literature reveals several 'threats to validity,' especially for findings on attitude changes.[15] Some of these threats have been mentioned and discussed in Chapter 6, and we commented throughout Chapters 6, 7 and 8 on the incidence of cases with performance improvements in the absence of attitudinal changes. These findings are not encouraging and the possibility does of course remain that productivity and quality improvements may be due to factors other than those postulated either in job redesign theories or in our own theory. This possibility could only be explored however by an examination of a large number of well documented and researched case studies, and these simply do not exist. For the present all that can be done is to place question marks beside job redesign theory and practice and to offer a number of suggestions for alternative explanations.

Proceeding onwards through Chapters 6, 7 and 8, we should consider the method of analysis employed in the literature review. Within each category of job redesign a number of case studies were discussed and the outcomes evaluated in terms of job redesign theories, and our own theory.

The method of argument in each case consisted in showing the effects, for productivity rises, and quality improvements where possible, of certain factors, such as labour elimination, pay rises, and methods improvements. The theory advanced in this thesis was argued for, (a) on the grounds that it offered more plausible explanations of the phenomena at issue, and (b) that changes in job attitudes and perceptions, posited as important by job redesign theorists, had often been shown not to have occurred in economically successful cases. The next step was to explain 'deviant' cases. It might be objected that this whole procedure is both inadequate and adhoc - inadequate because not all available case studies were discussed in depth, and ad hoc, because of the sorts of explanations offered for deviant cases.

Whilst a more detailed analysis of a larger number of cases might have been desirable, the fact is that there are far more cases worthy of discussion than space available in which to discuss them. Such a discussion would also have been somewhat repetitious. It is, however, true that some of the explanations offered for deviant cases in each of the three categories, i.e. cases with productivity improvements, but no pay rises, labour elimination etc., do have a rather ad hoc character. For instance, it was suggested that in the absence of labour elimination in category III redesign, productivity increases might still accrue if the production systems in question were operating well below their technical capacity. This suggestion was simply advanced as an hypothesis, although

supporting evidence was sparse. Whilst this sort of argument does have an ad hoc character, there is at present, in view of the limitations of the literature, no alternative to the production of hypotheses of this sort. And given the obvious complexity of the phenomena under discussion, I would suggest that an attempt to produce an adequate theory must proceed here by the production and revision of hypotheses. To reject them simply because they appear unable to account for the results of certain cases would in my view be premature.

Finally, it should also be noticed that many of the arguments advanced in the literature review are based on correlations, between labour elimination, and productivity increases for instance. Whilst some of the arguments were expanded upon in Chapter 9 which examined case studies, this was not true for all of them. It was thus unclear, for instance, whether in certain cases the elimination of labour was cause or effect of a productivity rise. This was particularly true in situations where other factors, such as pay incentives had been operative. It may sometimes be possible to show that a particular set of job changes resulted in no increase in total output, but only in its redistribution among the workforce, and here one would be justified in saying output per man hour could not have increased without the elimination of labour. In many cases however, figures were only provided on increases in productivity, not production, and it would therefore be impossible to say

in these cases what role was played by labour elimination.

Some of the above problems might have been partially resolved by means of a thorough case study, combining data on employee and managerial attitudes and behaviour, as well as technological and production data. All of the cases in Chapter 9 fell short of this ideal and are in some respects unsatisfactory. Part of the reason for this lacuna is the traditional problem of securing access to an industrial organisation in order to carry out research, but the problems are compounded in the present situation by three factors. First of all research in this field, as in any other area of industrial change, can only be conducted in the small proportion of companies engaged in the relevant change processes. This fact greatly reduces the potential number of organisations that may be approached for access. Secondly, there is some evidence that formal job redesign projects, that is, moves to despecialise labour conducted as job redesign, may have declined slightly in number over the past few years. The following table shows the starting dates for projects reported by the Work Research Unit in its comprehensive British Survey, published in August, 1975.[16]

TABLE 25 Starting dates for job redesign projects reported by the Work Research Unit in 1975

1950s	1960-64	1965	1966	1967	1968	1969	1970
1	2	0	5	8	7	11	17

1971	1972	1973	1974	1975	Don't know
13	5	7	3	0	33

Thirdly, those few recent projects, i.e. 1974 or afterwards, that have been started, have been 'monopolised' by research centres or university departments in liaison with the Work Research Unit, or by independent research teams, e.g. The Henley Work Research Group, or, perhaps, by consultants. The field left available for independent researchers is thus small indeed.

I don't believe however that an all-or-none type of argument should be applied to case studies: it is too easy to dismiss, or ignore, cases that are less than adequate, methodologically. A more fruitful, and a more difficult, approach is to draw whatever conclusions one can from the data that is available, and to state clearly their limitations, and this is what I have tried to do.

The questions of motivation and satisfaction

As a number of recent reviews have indicated, the field of motivation is exceedingly complex and has given rise to an enormous literature spanning both empirical studies testing single hypotheses as well as broad theoretical formulations.[17] I make this point as a way of stating the impossibility of doing justice to the complexity of the field in a short section such as this. Rather than try to review, compare and contrast several theories of motivation, especially motivation at work, a task which has been adequately performed elsewhere, I shall instead focus on a

number of specific issues that are important in our understanding of both job redesign and industrial behaviour more generally. These issues are as follows: i) the concepts of motivation and satisfaction, ii) the role of pay, iii) process and content theories of motivation, iv) social factors in motivation and satisfaction, v) individual differences, vi) intrinsic and extrinsic rewards.

i) It has been argued in this thesis that these concepts should be separated analytically, and should be seen as having different 'causes,' on the whole. The term 'motivation' was used rather loosely to denote an inclination to perform one's job, whilst 'satisfaction' was used, again rather loosely, to refer to feelings associated with the job.

At a conceptual level, the distinction between motivation to perform and satisfaction (with performance, with pay, co-workers etc.) seems intuitively reasonable. The difficulties arise when one starts to think in more detail about the meaning of the terms satisfaction and motivation, and some of the mechanisms involved in their causation.[18] In the present work I have sought only to separate out these two concepts, and to argue they are related (principally) to different features of the work situation. And insofar as this work rests on possibly dubious assumptions about the precise nature of each of these terms, it must to that degree be regarded as provisional in character.

ii) The argument advanced in this thesis was that the data available from cases of job redesign reported in the

literature did not fit the theory that certain changes in job content were principal causes of enhanced motivation, and consequently of performance improvements and attitude changes, and it was suggested that changes in performance could be attributed in part to the operation of more traditional control systems, such as payment, and to labour displacement and methods changes. Given the ambiguity of the evidence it was not possible to opt unambiguously for one theory or the other, or to specify in detail conditions under which each may be appropriate as an explanatory device. It may legitimately be asked however whether the role of traditional 'carrot and stick' methods has not been overstated. After all, there is much evidence on the negative consequences of such methods, and recent theories and researches have attempted to cope with some of the problems raised by the traditional theories and their associated methods.[19]

Some of the recent evidence, and summaries of evidence, on pay as a motivator, were presented in Chapter 5 where it was shown that the evidence tended to support the efficacy of financial incentives, especially when paid individually, and of pay rises under a regime of incentives.[20]

In the case studies reviewed in Chapters 6, 7 and 8, 43 contained information on payment systems, and of these 26 involved either a group or individual incentive. Clearly we cannot say definitely that pay incentives were effective in all of these cases, but the evidence on pay incentives generally tends to support such a conclusion. There remain

17 cases which involved flat rate (or time rate) payment systems, and about these we can unfortunately say very little. In some of these cases, other mechanisms may have been involved, whilst in others, productivity improvements were of small magnitude.

The evidence on the importance of pay as a factor in job attitudes and/or job satisfaction has also been studied by a large number of authors, and summarised by Lawler.[21] Whilst pointing out the methodological deficiencies of much of the research in this area, he nevertheless concluded that pay tended on average, to be rated about the third most important factor in choosing or liking a job. On the other hand, the classic study by Morse & Weiss appeared to show that people worked for more than just money.[22] When asked if they would continue working after having been granted a guaranteed income, over 80% of blue collar, American workers said they would. It is not clear whether this shows that people do actually have non-monetary motives at work, or whether, under different conditions, they could have such motivations.

Nevertheless, both the motivational character, and the importance of pay in our society, seem well established. There are of course, many negative consequences of pay incentives, and of the forms of managerial control with which they are often associated. Perhaps the most widely discussed of these effects is 'restriction' of output. The phenomenon

is hardly new, and was certainly familiar to Taylor, but with the extension of pay incentive systems after the 1920s, the phenomenon naturally became more widespread, and was 're-discovered' in the 1940s and '50s by Dalton, Roy, Whyte and others in their now classic researches.[23] Whatever the pervasiveness of output restriction, and however serious the phenomenon, knowledge of it spread and played a part in the declining popularity of such schemes in the 1960s. In the U.K., payment by results, as they were collectively known, came to be replaced in some companies by a fixed wage-performance contract scheme, such as Measured Day-Work, an indication of the growing disenchantment with incentives.[24] Nevertheless, Lawler's review of the evidence up to 1970 gave no grounds for thinking these industrial changes were wholly justified, although he acknowledged the existence of output restriction. Just as one cannot say that pay incentives will be effective under all circumstances, so equally it cannot be argued that restriction of output will be found under all conditions (leaving aside for the moment the problems in defining a normal, or fair day's work that are necessarily entailed in the idea of output restriction).

iii) It must be acknowledged however that the so-called rational economic man theory of motivation does have problems and limitations, and some of these have been explored by contemporary theories. It is customary when discussing such work to distinguish process and content theories of motivation.

The former specify the social, cognitive and/or affective processes involved in motivation, whilst the latter attempt to specify individual needs or wants and the classes of object or reward that can satisfy them. Expectancy theory would be an example of the former, and Maslow's need-hierarchy, an example of the latter.

It should be said at the outset that the material presented in this thesis allows no statement to be made about motivational processes. It cannot therefore be used to judge the validity of expectancy theory for instance since none of the pertinent variables have been measured, or indeed even examined, although it is always possible that some of the findings in the thesis might be interpreted in expectancy theory terms.[25] It has sought simply to examine a number of content theories of motivation, centred around a group of task dimensions (autonomy, variety, etc.,). Indeed, we cannot comment systematically on other content theories of motivation, such as Adam's equity theory (which is actually a combined content-process theory),[26] or McClelland's need-achievement theory.[27] Whilst it may appear that the evidence of a number of cases where workers called for wage rises after job redesign lends support to equity theory, it is also possible that workers were simply using the changes in job content as a basis, or pretext, for wage demands that actually derived from another desire, e.g. to protect falling living standards in the face of inflation.

iv) The next issue to be considered is the question of social factors in motivation. The "human relations" critique of Taylorism, i.e. that it ignored workers' social needs, is well known and requires no repetition, although some of the evidence used to support the critique against 'rational-economic man,' such as output restriction in response to group pressure, can be given a rational-economic interpretation.[28] Schein has recently argued that a proper understanding of worker motivation must consider economic, social, and 'self-actualising' aspects of motivation, as advanced by Taylor, Mayo and Maslow respectively, in a formulation he called 'complex man.'[29] It may be objected against job redesign, particularly category II, and to some degree, category I, that it ignores or underplays the social needs of the workforce, sacrificing them to production.

We must be careful, in evaluating this critique, to make two sets of distinctions: firstly, we must distinguish its moral and empirical features, and secondly, we must be clear as to whether we are discussing job satisfaction and job attitudes, or performance and motivation, as our principal dependent variables. (See below). In the Meccano case study (an example of category II redesign) many of the workers complained about the isolation which they experienced in comparison with the progressive assembly lines, but despite this grievance, performance levels were high, approaching 100% BSI, because of the combined effects of pay incentives and supervisory control. In this situation, the company

could be morally condemned for failing to satisfy the social needs of its workforce, and it could also be argued that overall job satisfaction might have been improved had more appropriate social arrangements been made. But motivation, as evidenced in levels of performance, did not appear to be so adversely affected. In other words we need to examine not only the expressed wishes and grievances of the workforce, but their priority as well - in the Meccano case, workers complained about social dissatisfaction, but gave priority to their economic needs (or interests). In other situations the outcome may be different but the point is that the consequences of relative isolation and restricted interaction opportunities cannot be assumed, following Hawthorne, but must be investigated and determined in each particular case.

v) Next, we must consider individual differences in motivation and satisfaction. It has been pointed out that one of the benefits of expectancy theory is that it does not impose a universal theory of human needs or preferences. Lawler, indeed, in supplying expectancy theory with some content, has also made no such assumption, acknowledging again that individuals differ.[30] Individual differences in job attitudes and job satisfaction were evident in a number of cases of job redesign, and one would also expect to find differences in employee behaviours after job redesign, i.e. in terms of productivity, etc. What I tried to establish were the factors responsible for the general efficacy of job redesign, an endeavour that in no way denies, or conflicts

with, the existence of individual psychological differences. Indeed such differences in job attitudes were suggested as a crucial factor demarcating the spheres of applicability of the classical, and the new theory of job redesign. But further research into such differences could only enrich our understanding of this whole area.

vi) Finally, let us consider the question of intrinsic and extrinsic rewards. Conventionally intrinsic rewards are seen as those internal to the individual, which he 'gives to himself,' such as feelings of self-esteem, pride etc., whilst extrinsic rewards are those provided from external sources by other agents (usually), such as pay, promotion etc. In the present work, behaviour was seen largely as a response to extrinsic rewards, whilst the role of intrinsic rewards was to provide satisfaction, or to change attitudes. Might not this distinction be overdrawn? After all, extrinsic rewards such as pay may have intrinsic components, such as self-esteem, or personal status, whilst intrinsic rewards may be valued solely for their connection with extrinsic rewards, such as power, or salary. Equally, it is possible that employees may respond to job redesign for <u>both</u> extrinsic e.g. pay, <u>and</u> intrinsic e.g. competence, self esteem, reasons. Again, it is possible that a change in job content initially valued for its extrinsic rewards, such as higher pay, may come to be valued eventually for the intrinsic rewards arising out of the performance of a 'meaningful' task. And

finally, there may well be cases of the opposite phenomenon occurring: university graduates may take up particular appointments for their intrinsic interest, job content etc., but find that before long they have grown accustomed to a much higher standard of living, and have begun to 'develop' an extrinsic or instrumental orientation to work.

On the first two points (the intermingling of intrinsic and extrinsic factors), it should be noted that in the thesis I was simply concerned to identify those factors - pay, job content, control - which seemed to be correlated with increases in performance. I was not exploring the reasons why people might be motivated by pay, for example, and indeed it is quite possible that there exists a variety of reasons for this. On the next question, that of changes in motivation arising out of work experiences, this is indeed a possibility in a number of cases. But there were several cases of attitude-behaviour discrepancy, i.e. cases in which there appeared to be no intrinsic orientation to work reflected in changed attitudes, where it seemed plausible to dissociate intrinsic and extrinsic motivation. On the basis of these 'deviant' cases it was then argued that the dissociation in empirical and analytical terms, between attitudes and behaviour was a more general phenomenon and of course such a view was more parsimonious than supposing that there were two sets of relationships between the mechanisms controlling attitudes and behaviour. Consequently, it was suggested that to explain improvements in job performance

required a focus on the 'extrinsic' mechanisms suggested in our theory.

Any subsequent developments in workers' attitudes, as a result of job redesign, such as an increased interest in intrinsic rewards, are clearly phenomena of some interest for industrial social scientists, but it is unclear how such developments might alter one's predictions about worker responses to future job redesign schemes. Would they be more willing to perform 'enriched' jobs without pay rises? Or would pay, control etc. continue to be the dominant factors influencing their work behaviour? Without more longitudinal studies on job redesign schemes, we cannot say which, if any, of these predictions might be confirmed. Equally it is unclear how such developments would affect the explanatory power of the theory presented in this thesis, except insofar as they point to the absence of any coherent notions of developments of job attitudes and orientations, an omission which ought, ideally, to be rectified.

The recent work of Deci and his associates is also of particular relevance to our present theme.[31] These studies have suggested that the introduction of financial rewards into experimental situations where subjects were performing tasks, and were, presumably, intrinsically motivated, has the effect of reducing measured intrinsic motivation. It is difficult to assess the practical relevance of this work because many of the studies have employed students on short term tasks in laboratory situations. In real life income

from work is generally essential, and not just supplementary, as in the Deci studies, and is not 'introduced' into a situation, but is there from the beginning, and is expected to be there (see also Chapter 5,above). In the light of these remarks it is, therefore, difficult to appreciate the practical relevance of these studies for employing organisations.

Effort, intensity and intensification of labour

It has been argued in this thesis that job redesign can be understood as a form of intensification of labour, that is, as a process in which either, or both, the rate of working, and the time spent working, are increased. It was assumed that this process would correspond with the exertion of effort, a concept that remained undefined. In this section some of the problems with these various terms will be explored, and we shall investigate in more detail the justification for treating job redesign as a form of labour intensification.

Effort is often understood simply in terms of energy expenditure. That is to say, it is seen as a process of muscular exertion, oxygen consumption etc.[32] Alternatively, it has been conceptualised as a function of the relation between information input and processing capacity, so that effort arises from over or under-stimulation.[33]

The intensity of working can be defined in at least two ways. Owen-Smith, for instance, appears to use the term synonymously with rate of working, that is with the rate of effort or performance.[34] There is, however, a second meaning which can be assigned to the concept, and that is a measure of the intensity of the working day,i.e. the proportion of the working day spent in working as opposed to non-working.[35] The greater this ratio, the greater would be the intensity of the work performed. Increased intensity

of labour may be brought about therefore in two ways, corresponding to these two definitions. Firstly, the rate, or pace, of working may be increased, and where this phenomenon occurs on mechanised conveyors or tracks, it is colloquially known as "speed up." But intensification of labour may also be seen in an increased proportion of working, as opposed to non-working time within the working day. Of course, these two processes may not be separated empirically in this way, and it is possible, for instance, that a strategy for raising working time, such as the assignment of more tasks may subsequently result in a faster rate of working. Analytically, however, the phenomena can be distinguished.

The way in which one measures effort and intensity will depend on the way in which they are defined. Unfortunately, it was impossible to measure effort in any of the case studies reported in this thesis, although such data can be found sporadically, throughout the job redesign literature, and will be referred to later,[36] (see also Chapter 4).

It is somewhat easier to assess changes in labour intensity, since there are many cases where the same volume of work has been performed by fewer workers, or by the same number of workers in less time.[37] In certain cases these productivity improvements have been brought about by methods improvements, such as the elimination of superfluous motions or activities, but the majority of cases have involved no such changes in methods, and may be regarded as instances

of intensification. This, in the majority of cases, is simply an inference, but its validity can be confirmed by considering that of the two other methods available for raising productivity - extension of working hours, and introduction of capital equipment - neither has occurred to any significant degree in job redesign.[38]

Only reorganisation of flow lines involved methods improvements as here defined - the other categories of job redesign therefore raised productivity by means of intensification of labour. Does this mean however that effort expenditure was also increased in these cases? To answer this question brings us back to the earlier discussion of definitions of effort and it also raises two other issues. Firstly, it may be argued that intensity of working is not synonymous with effort expenditure, since the latter depends, at least in part, on whether work is self-controlled or externally-controlled. In the former situation increased output may materialise, but effort expenditure fall because of the reduction of external constraint. The second issue concerns the rather pejorative use of the term intensification throughout this work, and the implication that enhanced effort expenditure is a "bad thing." Let us deal with each issue in turn, although as we shall see they are in fact related.

On intensity and effort it is sufficient to observe that there need be no correlation between the objective and subjective aspects of intensity. A greatly increased work load may not be experienced as such because of the simultaneous removal of other sources of strain, such as mechanical pacing.

The fact would remain, however, that in terms of the ratio of working to non-working time, intensity of labour had increased no matter what the mitigating factors. It should also be noticed that the equation of pacing with strain, and self pacing with reduced strain, does not always stand up to empirical test, as will be shown in Chapter 12. All we can say here is that different indices of effort - duration and pace of working on the one hand, and perceived effort on the other - may move in opposite directions. There would thus appear to be no more justification for saying effort expenditure increases than for saying it decreases, although we can say that the intensity of labour, as defined here, does increase. We must, for the moment then, divorce effort expenditure and intensity of labour, at least theoretically and present our overall argument, generally, in terms of the latter concept, but use the former only where concrete evidence would justify this.

If, however, there need be no correlation between actual intensity and perceived effort, are we justified in writing of intensification of labour in a somewhat pejorative and critical manner? In order to answer this question and comment also on the previous one, I think we must distinguish two broad conceptions of, or approaches to, the term 'effort.' On the one hand, there is the psychological view, which we have already encountered according to which perceived effort expenditure may decrease under job redesign. But on the other hand there is an economic view associated with Baldamus, in

particular, which treats effort in a very different manner, and which locates it in the context of worker-employer relations.[39] For Baldamus such relations are inherently antagonistic since wages are rewards for the workers, but costs for the employer. The basic exchange between the worker and employer is that of wages for labour: workers "give" their labour or effort, and receive wages; the employer gives wages and receives labour, understood as productive activity. Within this wage-effort exchange both parties seek to maximise their own interests, and for the workers, this according to Baldamus, means maintaining or reducing effort, whilst increasing or maintaining wages, respectively.

According to this conception, therefore, increased productive activity, or effort will benefit the employer primarily, unless workers can also increase wages proportionately (at least) and hence maintain the given wage-effort ratio. Economically, therefore, it would be legitimate to adopt a critical stance towards managerial schemes for the enhancement of effort, or the intensification of labour, within the working day. Though from a psychological perspective, one might well arrive at different conclusions.

More broadly, productivity can be raised in four ways (as indicated above), two of which increase, and two which tend to decrease, effort expenditure per unit output or *in toto*. If one argues that historically more recent methods-mechanisation, and methods improvements - tend to reduce

effort expenditure, and tend to be more effective means for raising productivity in the long term, then from this standpoint, intensification of labour may be criticised for tending to be historically regressive.

Summary and conclusions

It would be fruitless to reiterate here the methodological and conceptual problems identified in the thesis, so I shall confine myself to a few observations. The theory of job redesign advanced here appears to have held up fairly well, although there are concepts - motivation, satisfaction, white collar worker, effort - which require more thorough analysis if the validity of the theory is to be fully appreciated. This type of analysis may, of course, throw up insuperable problems for the theory, but the need for it does not in itself seem to me sufficient grounds for rejecting the theory.

Some modifications can undoubtedly be made even at this stage, e.g. it may be necessary to present the theory as being, at a general level, concerned with labour intensity where this, at present, is to be understood as conceptually separate from effort intensity and expenditure.

It would, however, be going too far to claim the theory offered a wholly adequate account of job redesign. There are cases and phenomena which it may be difficult, at present, to explain, and it is to be hoped that future research will

introduce suitable modifications, perhaps along some of the lines indicated in the previous sections. Equally, there are many methodological problems which must be overcome in future studies if a proper evaluation of the theory is to be produced. It may, however, legitimately serve as an alternative to the 'classical' theories, and one that would seem, in the light of the material in this thesis, to merit further testing, and refinement.

NOTES AND REFERENCES

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2. Archer, J.T. 1975.

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4. cf. Lawler, E.E. et al. 1973.

5. van Gils, M.R. 1969.

6. Rush, H. 1971.

7. cf. Nicholson, N. et al. 1976.

8. cf. Anderson, J.W. 1970; Little, A. & Warr, P. 1971; Morse, J.J. 1973. Birchall, D. et al. 1973.

9. cf. Kelly, J.E. 1978B.

10. Thornely, D.H. & Valentine, G.A. 1968.

11. Lawler III, E.E. 1973, pp. 83-4.

12. Marriott, R. 1968.

13. King, A.S. 1974.

14. Marriott, op. cit., p. 174, pp. 238 ff.

15. Cummings, T.G. et al. 1977.

16. Butteriss, M. & Murdoch, R. 1975.

17. Lawler, III, E.E. 1973. Warr, P.B. 1976B; Miner, J.B. & Dachler, H.P. 1973.

18. cf. for instance Blauner, R. 1960; Locke, E. 1969; Nash, A. 1976; Singleton, W.T. 1977; Taylor, J.C. 1977; Warr, P.B. & Wall, T.D. 1975. On motivation, see note 1.

19. cf. Marriott, R. 1968, Chap. 7; Brown, W. 1963.

20. cf. also Anon. Financial Incentive Schemes and Productivity, 1977.

21. op. cit. p. 59; cf. also Warr, P.B. & Wall, T.D. 1975, Chap. 3.

22. Morse, N. & Weiss, R.S. 1970.

23. See the articles in Part One of Lupton, T. 1972.

24. See Shimmin, S. Postscript, in Marriott, op. cit.

25. See for instance, Graen, G. 1969; Mitchell, T.R. 1974; Wahba, M. & House, R. 1974; Miner & Dachler, op. cit.

26. Adams, J.S. 1965; Pritchard, 1969.

27. McClelland et al, 1953.

28. Carey, A. 1967; Sykes, 1965.

29. Schein, E. 1970, Chap. 4.

30. Lawler, 1973.

31. Deci, E.L. 1975. For more recent work in this area see the review by Korman, A.K. et al. 1977.

32. See for instance Murrell, K.F.H. 1965, Chaps. 16, 17.

33. See Currie, R.M. 1972, Ryan, T. 1947.

34. Owen-Smith, E. 1971, p. 11.

35. This measure has been used by Pontarollo, although it was not defined as labour intensity. See Pontarollo, E. 1973.

36. See, for instance, Chap. 12.

37. See Chaps. 4,6, 7 & 8.

38. Owen-Smith, op. cit., p. 11.

39. Baldamus, W. 1961.

CHAPTER 12 SOME IMPLICATIONS

Introduction

This penultimate chapter seeks to extend some of the previous discussions by drawing out a number of the implications of the arguments and the theory advanced in the thesis.

In the first section we take a more abstract look at the present and the classical theories of job redesign, in terms of their assumptions about work and workers. Underlying many theories of work motivation, job attitudes etc. can often be found a series of unarticulated assumptions about work and its meaning and possibilities and about the social and economic constraints which affect them. In some cases assumptions of this kind may be absent, and that in itself may be a problem. But taking an overall view, it is possible to see the new theory as part of a more 'pessimistic' tradition of theorising, and classical job redesign as belonging to a more optimistic vein. This section will explore these images of work and the worker and discuss the implications of the theory offered in this thesis.

The next section deals, historically, with the concept of labour intensification and seeks to challenge a prevailing view within job redesign theory which posits a fundamental

discontinuity in managerial practice sometime in the post-war period. The section tries to show the existence of an even more fundamental continuity of practice, and can thus be seen as an exercise in historiography.

The conclusions from this section are carried over into a discussion of the future of job redesign and used to inform ideas about the forms which this phenomenon might take in the future.

Finally, the implications of the theory for research are described and a number of possible investigations suggested.

The new and the classical theories of job redesign: images of work and the worker

The classical theories of job redesign argued that the principal mechanism responsible for attitudinal and behavioural, outcomes was 'intrinsic' or task-motivation- workers were thought to display an increased motivation to perform as a result of the improved content of their jobs, which were now richer in responsibility, autonomy, variety etc. In contrast, the new theory argued that the principal mechanisms of productivity and quality improvements were extrinsic to the job itself, and included the traditional, organisational mechanisms of pay rises and incentives, labour elimination and raised workloads, improved work methods, and increased accountability and control. (It was also argued that the classical theories could be applied to a small minority of the workforce).

As well as offering quite different explanations for the same phenomena, these two theories would also seem to entail different assumptions and images about work, and the worker, and it is these which I now want to articulate, and then examine and comment upon.

Classical theories of job redesign have been associated with what MacGregor called 'Theory Y.' [1] Whereas Theory X suggested man had an inherent dislike of work, had to be punished and threatened to perform it, and preferred to be directed and controlled, craving little apart from security,

Theory Y was very different. The assumptions of this theory were that man had a hierarchy of needs - physiological, social, self-esteem and self-actualisation, - (i.e. Maslow's hierarchy), that work was natural, that man would perform in the service of objectives to which he was committed, committment being a function of rewards, and that he learns and seeks responsibility. Different combinations of these latter assumptions can be seen to have underpinned the different theories of job redesign discussed earlier in the thesis.

At the same time the division of labour, a feature of industrial life treated as unproblematic by Taylor, was elevated to the status of a major problem by the theorists of job redesign. It was seen as responsible for absenteeism, turnover, dissatisfaction, high labour costs, restriction of output, strikes, and poor quality work and performance.[2]

Work in industrial society is thus seen to entail a fundamental conflict between the needs, wishes, and capacities of the individual, and the constraints of the division of labour, itself a product of outmoded organisational philosophies. The individual is seen in a much richer and more complex manner, and also perceived as more willing to contribute to organisational objectives, under the appropriate circumstances.

At the same time features of work which for Taylor were problematic, such as the economic basis of co-operation, or the form of wage payment, have, generally speaking, been regarded as much less problematic by theorists of job redesign, who have focussed their attention on the conflict mentioned above.

The new theory of job redesign advanced in this thesis would seem at first sight to entail some of the assumptions about work and workers more commonly associated with Taylorism. In other words, it would appear to suggest that insofar as performance improvements were allied to pay rises and the use of incentives, that pay remains an important source of motivation in contemporary industrial organisations. Equally, the stress on enhanced control and accountability could be taken as indicative of a lack of faith in the capacities of workers to control and monitor their own activities, and as supporting the need for systems of authority and control in organisations. Whilst the scepticism regarding the mutuality of interest satisfaction under job redesign, and the suggestion that the costs for workers are higher than hitherto realised, would seem to entail an antagonistic view of worker-employer relations. Surely it might be argued these assumptions are both simplistic and inaccurate?

Before reviewing some of the problems inherent in the assumptions of both theories, one important point should be made about those underlying the new theory. A stress on pay systems, control and differential interest satisfaction in an explanatory theory of a given phenomenon (here, job redesign) does not in end of itself entail a particular system of values (as noted briefly in Chapter 1). Indeed, at least two such systems, broadly speaking, would seem to be possible according to the perceived origins of the necessity for financial motivation, control etc.

Under one system workers are seen as inherently lazy, desirous of material wellbeing, and averse to taking on responsibility. Motivation of workers to perform well at their jobs thus takes the form it does because of the inherent characteristics of the workforce, which are difficult, if not impossible, to change. Co-operation between workers and employers is partly coerced, and partly built on the economic basis of high wages and low labour costs. This view is close to Taylor's,although it is not identical with it, as writers such as MacGregor,[3] and to a lesser degree, Schein,[4] have falsely suggested.

But there is an alternative perspective, stretching back to Marx, in which the current stress on pay and control in organisations is seen to reflect the economic antagonism in the employment relationship.[5] In Marxist theory this antagonism takes the form of class exploitation, and extraction of surplus value from the working class; in more recent industrial sociology, e.g. Baldamus,[6] it has been presented in terms of the wage being simultaneously a cost for the employer and a reward for the worker. At the same time, however, it has been argued by Marxists in industrial sociology that economic antagonism is not inevitable and eternal, but is bound up with a particular mode of production. One can thus conceive of circumstances under which pay incentives and external control would become much reduced in significance.[7]

Let us now turn to examine some of the problems with the two sets of assumptions, articulated above, starting with those of the classical theories. Some of the problems of these theories derive from their inadequate treatment of the role of wages and the presence of conflict in employment relations.

Emery & Thorsrud, for instance, wrote of the Norwegian projects that,

> "We had overestimated the extent to which men thought critically about the limitations of their present jobs, and we underestimated their fearful suspicions of management." 8

An admission such as this is rare indeed in the literature of job redesign, but it is by no means the only example.

> "Wages are the only negative aspects, although prospects of an upgrading were held out: "We are not being paid for the job we do." " 9

That observation was made by den Hertog, about one of the Philip's case studies, whilst employees in case studies by Walton,[10] Locke et al.,[11] and Hill,[12] two of which are often cited success stories, also began placing demands for, and expressing dissatisfaction with, pay levels. Changes in job content have not been seen universally as an 'enrichment': in the ICI studies, considerable improvements in performance resulted from the five white collar studies, but with the blue collar workers, matters were a little different:

> "... the calculations needed for working out the efficiencies were interpreted as an extra chore rather than an attempt to give the men some real control over plant operation." 13

Such attitudes to work and to management have even been observed in the famous Volvo-Kalmar plant, as a recent report has indicated.

> "... there is a feeling that changes made by the workers, (assemblers - JK) in order to facilitate the work and reduce assembly time, results in an increase in the so-called "undistributed time"... In the interviews it was explained that this was something that could be exploited by the company when the product line is being changed - that is, the company could add new assembly tasks in order to use up this undistributed time." 14

These quotations and comments illustrate three aspects of employment relations that have received little attention in the literature of job redesign:

i) the perception of work as <u>labour</u>, that is, as an undesirable activity; as a worker at ICI expressed it, when talking about job rotation,

> "You move from one boring, dirty, monotonous job to another boring, dirty, monotonous job..... ...And somehow you're supposed to come out of it all "enriched." But I never feel "enriched," - I just feel knackered." 15

ii) The consequent instrumentalisation of labour seen in its exchange for wages, and concern over the wage effort bargain;

iii) suspicion of managerial intentions, evidenced in the belief for example that methods improvements may simply prepare the way for intensification of labour.

None of this is to say that workers may not like, prefer, or appreciate the changes made in their jobs, for they certainly

did in a number of the cases cited earlier as the attitude surveys and/or interviews showed. But at the same time they also preserved a concern for issues that we might label under the heading of 'exploitation.' The existence of these two aspects of workers' consciousness (as evidenced in some cases, at least) has been argued for by Daniel, although he attempted to relate them to separate contexts, the bargaining situation, and the daily work situation.[16] His data has been rightly criticised by Whelan,[17] and the data reported in the studies from which the above quotations were taken did not suggest that intrinsic and extrinsic 'orientations' (to use Goldthorpe et al's term)[18] were context specific. The mutual existence of these attitudes is important in the present context because it has a bearing on the arguments advanced by job redesign theorists for the possibilities of employer-worker co-operation and mutual interest.

Such co-operation is seen to be related to the satisfaction of the psychological needs of workers (and the economic interests of employers), but there has been little attempt to cope theoretically, with the economic interests of workers and their attitudes to employment and managers (as illustrated above). Herzberg did try to conceptualise 'the hygiene-seeker' as a psychologically-sick individual with a very strong interest in wages. And in recent years a number of job redesign theorists have argued for the importance of pay in an overall package of job and organisational

redesign. Writers such as Herrick & Maccoby,[19] Walton,[20] and Hill,[21] have all advanced the idea that pay equities must be maintained in job redesign schemes. Equally, one can find reference in the works of the sociotechnical theorists to the use, and salience, of pay incentives, but this question has not occupied a major position in their theoretical formulations.

Taylor, of course, moved in the opposite direction, as we saw in Chapter 2, i.e. beginning with an emphasis on financial motivation and incentives, he eventually came to develop an awareness of the need for changes in work attitudes of a more fundamental nature, summed up in his phrase 'the mental revolution.'

The theory presented in this thesis has attempted to cope with the economic and psychological aspects of worker-employer relations by positing a dual-mechanism thesis, according to which job performance is under the control of mechanisms such as pay, work methods, accountability, whilst job attitudes are influenced both by these and by a wider range of aspects of the work situation. Thus, associated with the wage-effort nexus is a series of attitudes (again, as illustrated above) which seem incompatible with more positive attitudes to job content. Yet this duality seems to be a feature of some work situations, and as such requires explanation within any theory of job redesign. Although the classical theories have endeavoured to theorise about this issue, they have done so in an ad hoc or an otherwise unsatisfactory manner, in contrast with the more systematic

theory offered in the present work.

There are, of course, ambiguities surrounding the assumptions of this new theory. For instance, it has been left unclear so far whether the theory is predicated on a Marxist view of employment relations, or on some other contemporary view, such as that of Baldamus, or perhaps Goldthorpe et al. Arguments about these issues would however in the present context be speculative, despite their importance. Equally, the relationship between worker concerns about wages and effort on the one hand, and general job satisfaction, on the other has been left unclear. These two themes would need to be clarified in some detail if further use were to be made of this theory.

What I have tried to show in this section is that the classical theories of job redesign are one-sided and partial in their understanding of the nature of work, of contemporary employment relations, and of the importance of pay. The new theory, although potentially more ambiguous in some of its assumptions, does nevertheless try to recognise both the importance of wage-effort and control issues for understanding behaviour at work, as well as the more intangible concerns with job satisfaction and with other features of the work environment. Whilst this theory hopefully corrects some of the one-sidedness and inadequacies of the classical theories, it is still in need of further development and modification.

The history of management practice

Many of the theoreticians and practitioners of job redesign have not only sought to advance certain ideas about job redesign and work organisation, but have also tried to evaluate their relationship with earlier theories and practices. In short, they have begun to write their own history. A recurrent theme in these nascent efforts is the idea of a rupture, or break, in managerial theory and practice, a phenomenon signified by the rejection of certain Taylorist principles, and particularly, specialisation of labour. In the case of Davis, for instance, such views are related to the notion of an impending transition from industrial to post-industrial society:

> "The papers (in Part 3 of his book with J.C. Taylor-JK) indicate that we are in the midst of an evolution, with discontinuities, in the development of man-made or designed jobs. Each development reflects the culture, including technology, of this era. The discontinuities reflect the very large changes under way in the social environment." 22

The industrial era is characterised by bureaucracy and scientific management, whereas the post-industrial era will usher in new values and new organisational designs.[23] A similar view is held by Eric Trist:

> "...the more complex, fast-changing, interdependent but uncertain world growing up in the wake of the second industrial revolution is rapidly rendering obsolete and maladaptive many of the values, organisational structures and work practices brought about by the first." 24

Frederick Herzberg has also discussed what he calls 'philosophies of personnel management,' and in so doing has pointed to the radical contrast between job 'enrichment' theory and industrial engineering:

> "Rather than rationalising the work to increase efficiency, the theory suggests that work be enriched to bring about effective utilisation of personnel ..... The term job enrichment describes this embryonic movement." 25

A rather more grandoise formulation has been advanced by Joe Roeber in his account of the Manpower Utilisation Plan and Weekly Staff Agreement at ICI, both of which drew, to some degree, on Herzberg's theory of job 'enrichment:'

> "The old social contract based, pace Thomas Hobbes, on many kinds of coercion is breaking down as the balance of power in society is changing. A new social contract must emerge from this period of transition .....WSA is a small step in the direction of that new social contract, a contract in which coercion will be replaced by ownership." 26

And it was twenty years ago when Robert Guest wrote about 'A Revolution in Job Design,' namely job enlargement. This was,

> "..... an attempt to reverse the trend begun many years ago with the spread of mass production, increased specialisation of labour, the growth of more complex business organisations and the influence of the theory of scientific management begun a half century ago by Frederick Taylor..." 27

Running through all of these comments and quotations is the notion of a rupture in managerial theory and practice, or, as Davis put it less dramatically, a "discontinuity." In place of specialisation of labour and other features of Taylorism there is to be despecialisation and workers'

autonomy and responsibility, the treatment of workers as humans rather than machines. In Chapters 5 - 10 it has been shown that the notion of an abandonment, or reversal of Taylorism must itself be abandoned if we are to understand the relationship between job redesign and scientific management, and that the different categories of job redesign have each preserved major elements of Taylorism, to varying degrees.

There are, of course, some discontinuities in current practices (as well as in ideologies). There are genuine reversals of labour specialisation; shifts from individualised to group job assignments and payment systems; and some blurring of the distinction between 'doing' and 'planning/ controlling.'

But beneath these genuine discontinuities in practice lies a much more fundamental continuity, a continuity embodied in the idea of, and striving after, labour intensification. Job redesign has been analysed in this thesis as a form of intensification of labour, and it is time now to draw out one of the implications of this analysis, an implication for the history of managerial practice. The intensification of labour (increased volume, or rate of working, during the working day) has a long history, stretching back to the legal limitations introduced in Britain in the 1840s, on the length of the working day.[28] The practice has taken various forms, according to local conditions, and to other factors, but the essence of the forms remains the same -

an attempt to increase working time, or the pace of work, within the working day. To demonstrate the various forms of this practice, for the present in a rather sketchy form, up to the present day, is to assert the existence of a fundamental continuity of managerial practice as a complement to the one-sided job redesign thesis of discontinuity.[29]

Marx was the first to draw attention to the phenomenon of labour intensification, that is,

> ".....increased expenditure of labour in a given time, heightened tension of labour power, and closer filling up of the pores of the working day,....." 30

This practice increased output and productivity (measured against cost, and man hours) by the reduction of fatigue, effects of pay incentives, and in connection with machinery, by increased speed of the machine, or the assignment of more machines to each worker.[31] Here is an example, again taken from Marx:

> "Thirty years ago (1841) one spinner with three piecers was not required to attend to more than one pair of mules with 300-324 spindles. At the present time (1871) he has to mind with the help of 5 piecers, 2,200 spindles, and produces not less than seven times as much yarn as in 1841." 32

Shortly after this period, in America, Frederick Taylor began to develop his theory of scientific management, one of whose objectives was to intensify labour. This was done, in the case of machining, for example, by increasing the speed at which the tools cut their steel, and in other instances, yard labour for example, by assigning "...a full day's work"...[33] Throughout the late nineteenth

and early twentieth centuries there is evidence to show that employers continued their drive for increased intensity of labour. In Britain, Phelps-Brown observed that employers both introduced new machinery, and also tried to increase the speed at which existing machines ran. This was combined with "... a new drive by management for faster work on the part of the men too."[34] Whilst in America, Henry Ford developed and introduced in 1914, a mechanical means for pacing, and hence for intensifying, simple repetitive work, in the form of the moving assembly line. This, when used in conjunction with Taylorist work study, proved to be an effective means of greatly intensifying the labour in automobile manufacture. Of course, there were a series of technical innovations introduced at more or less the same time, which also helped raise productivity, as well as a more pronounced division of labour, but nevertheless,

> "The work was hard, the pace inexorable, the pressure for ever-better production insistent." 35

With the introduction of machine pacing in mass production, assembly line working, there emerged also the form of intensification known as 'speed-up,' in which work pace was increased by the simple expedient of raising the track or line speed thus compelling faster working. With the expansion of mass production and flow line organisation in the new industries of light engineering, and domestic appliances, in the inter-war years, speed-up became an important phenomenon, although other forms of intensification persisted. The Reports of the Factory Inspectorate for the

mid - 1930s confirmed its persistence, as they had first drawn attention to the phenomenon in the 1860s:

> "Speed is the essence of present-day industry, as exemplified in the conveyor system,....." 36

And Branson and Heineman indicate some of the forms taken by the concern for speed:

> "In cotton, weavers were required to work six looms instead of four. In mining, piecework rates were cut, conveyors brought in, and the yardage of coal face each man had to clear was lengthened. In light engineering, motor factories especially, the speed of the conveyor belt determined the time the worker had to complete his operation: by speeding up the belt the operative could be compelled to work faster." 37

And in the textile industry an earlier form of intensification -assignment of more looms to each weaver - also took place during the Depression of the 1930s.[38]

After the war, in the 1950s and '60s the drive for intensification in the UK assumed the form of an attack on job demarcations as a form of restrictive practice, and of the 'overmanning' to which this gave rise. The effect of overmanning was seen as the raising of labour costs and that of demarcation as a restriction or curtailment of individual workloads. According to Brown one of the major outcomes of the restrictive practices and overmanning debate was the phenomenon of productivity bargaining; a possible solution to the 'problem' of 'restrictive' practices.[39]
These productivity agreements took various forms, but the most well known agreements, at ICI and Shell, involved substantial reductions in the work force whilst output remained constant.[40]

There were no technical improvements in these cases, although there were some methods improvements, i.e. more efficient working methods. These nevertheless could not wholly account for the productivity rises that were obtained, and to see what factors were responsible we need to examine some of those cases more clearly.

The Weekly Staff Agreement at ICI was introduced conjointly as productivity bargain and job 'enrichment,' the latter appellation reflecting the enhanced variety and responsibility in work implied by several clauses in the Agreement. Thus for example,

> "Work should be organised so that each employee's time, skills, and capacity to accept responsibility can be fully and effectively employed....Signatory Unions agree (to) ... some flexibility between craft and non-craft employees..... The employment of craftsmen on plant operation should the requirement be indicated....." 41

The connection between demarcation and productivity was clearly present here, but what should also be noticed is the conceptualisation of internal labour mobility, "filling up the gaps in the work day" as Marx put it, as 'flexibility.' [42]

In the productivity agreement at the Steel Company of Wales, reported by Owen-Smith, new working practices were again an important feature, and were also described in terms of internal mobility:

> "For example, if the men were having an easy time on the furnace then possibly they would be put to work in the scrap yard .....It was not just mobility among workers at Port Talbot that management proposed. Other branches of the South Wales Group, and even other firms, could be considered potential work places....Further several work roles would be amalgamated and assigned to an individual employee." 43

Again, it should be made clear these were not secondary, or ancillary components of the productivity agreement, for in Owen-Smith's view,

> "A 'buying out' of all current forms of restrictive practices, in order to increase the mobility, flexibility and interchangeability of labour." 44

is one of the two defining features of such an agreement, the other being the tying of wages to performance.

Finally, if we consider the National Power Loading Agreement in the coalmines, we find once more a stress on flexibility as an advantage accruing from the abandonment of piecework:

> "Deployment of men can be more flexible than when earnings varied from face to face....." 45

The common feature of these three agreements, and indeed of the Dairy case reported in Chapter 9, was that all occurred in capital intensive industries - chemicals, oil, coal and milk production - and it is in these industries that there is a premium on maximum capital utilisation.

> "The sophisticated nature of much modern plant and equipment has meant that continuous operation, and continuous manning has been increasingly necessary on technical grounds." 46

If we consider the three categories of job redesign analysed in this thesis it will become apparent that each of these has certain affinities with past forms of labour intensification. Several examples of vertical role integration in manufacturing industry involved the amalgamation of work roles, so that, in effect, fewer workers tended a given number of machines and performed the requisite functions. The earliest known study of 'job enlargement,'

of category I redesign, was the case reported by Walker, in which the jobs of operative, setter, and inspector were collapsed into one. In this way, the labour performed by the operative was intensified, as the 'gaps' in her working day were filled in with additional labour. In flexible work groups we found a form of despecialisation of labour through flexibility, in which we can detect one traditional and one contemporary form of intensification. The traditional form is the increased ratio of machines to workers: in the case of category III redesign, of course, this is a group of workers. The more contemporary form is that of labour flexibility, observed in the three productivity bargains described above, and in the case of the dairy, discussed in Chapter 9. As regards reorganisation of flow lines, the intensification which may occur there consists simply of an increase in effective working time, a phenomenon induced by the payment of incentives, usually on an individual basis.

As we said earlier there are of course differences in the forms of intensification over time, and between industries, but the fact remains nonetheless that we are dealing with <u>forms</u> of one and the same phenomenon. It should also be emphasised that we are dealing here with managerial practice (intensification of labour) and not with ideology nor developments within industrial social science, where there have been several fundamental shifts of problematic - from payment systems and workload, to the

operator's physical capacity and limitations, through to patterns of supervisory behaviour, to formsof job content - performance relations. Overall then it can be seen, even after such a brief and schematic review, that the notion of a discontinuity in managerial practice and theory is in need of serious revision, in the light of the general continuity which has been shown. We cannot as yet offer any more precise conclusion because the relative status of these different tendencies remains unknown.

The future of job redesign

A number of writers have recently questioned whether job redesign is anything more than a transient fad in managerial circles, destined to decline after its period of popularity,[47] although others suggest it will in fact increase in popularity in future years.[48] Since this is a question of some controversy, and also of some interest, it will be pursued here in some depth, so let us begin with some evidence.

There is a certain amount of evidence to suggest that job redesign is in decline. Academic criticisms of the practice, which began in 1968 with the critique by Hulin & Blood,[49] have increased in recent years. In 1972 there appeared an article by Reif & Luthans questioning the gains that could be derived from job redesign.[50] In 1973 there appeared articles or papers by Scott, 51

Imberman,[52] and Penzer,[53] which raised questions about the duration of redesign effects and about the pervasiveness of worker disinterest. The following year saw publications by Fein,[54] and Schrank,[55] which tried to reinterpret some of the more well known cases of job redesign, an endeavour continued in 1975 by Parke & Tausky.[56] A number of failed cases were published in the mid-1970s, notably by Frank & Hackman (1975)[57] and by Locke et al (1976),[58] and major theoretical and conceptual critiques continued to be written, including, most notably, those by Tausky & Parke,[59] Fein,[60] Blackler & Brown,[61] and Batstone.[62]

In addition to all of these articles, trade union journals, especially in America, carried a large number of critical responses to the 'Work in America' study, published in 1972.[63] Whilst it is also true that there was an earlier phase of studies questioning the extent of dissatisfaction with repetitive work, from 1955 to 1962, these studies may best be seen as marking a temporary decline of interest in what was known as job enlargement - a specific form of job redesign - rather than any general decline in redesign as such.

We could also point to the <u>apparent</u> decline in the number of redesign projects started within the last seven or eight years, as noted in the WRU Report on such projects in the UK, described in Chapter 11. And Thackray has suggested that the recession is leading many US managers to think again about job redesign, and indeed about many

behavioural science assumptions prevalent in the 1960s and early 1970s.[64]

Taking these pieces of evidence together it would appear that job redesign is indeed on the brink of vanishing, despite the fairly recent flurry of activities and events, which included the establishment of national institutions throughout Europe.[65] We should however exercise considerable caution before arriving at such a judgement, and take not of an earlier historical experience, in some ways similar to the present one. In conventional histories of industrial psychology and management, Taylorism is commonly thought to have been superseded by 'human relations' theory, yet as Braverman has correctly noted nothing could be further from the truth for,

> ".....If Taylorism does not exist as a separate school today, that is because, ...its fundamental teachings have become the bedrock of all work design." 66

I would suggest that the same may be true of job redesign and that the decline of the <u>ideas</u> of redesign within the academic world, should be distinguished from the fate of the practices to which these ideas refer.

There was an identifiable basis, or rationale, for the persistence of Taylorism, insofar as it offered a series of techniques, and an overall strategy for raising productivity. It would be an overestimation of the significance of job redesign to say that it offered anything comparable to time and motion study, or incentive pay systems,

but it could form one of a group of techniques adopted by management in order to increase labour productivity. This is particularly the case in the UK, where, as many writers have documented, the productivity of labour is, on the whole, considerably lower than in the rest of Europe, or in the USA.

A study reported in the 'Guardian' noted that in the West Midlands engineering firms that were examined, "neither labour nor plant was employed on "directly productive work" for more than an average of 50 per cent of the time available."[67] Jones has noted that whereas UK labour productivity was 15-40% higher than that in France, West Germany and Italy, in 1955, the position had dramatically reversed by 1973 and labour productivity in France and Germany exceeded that in the UK by 30%.[68] On the criterion of value added per worker (as opposed to physical output, the basis of labour productivity measures), workers in five EEC countries, in 1970 added between 1½ and 2½ times as much value to their products as their British counterparts. Two studies published in 1976 yielded similar findings. In the first study it was found that labour productivity in similar industries in Sweden was significantly higher than that in the UK,[69] whilst in the second study, it was shown that in a comparison between British and European subsidiaries of the same company, labour productivity in the latter was often 15-30% higher than in the former.[70] Numerous reasons

were advanced to explain these differences, and they included management training and organisation, factory organisation, and worker attitudes.[71] Also mentioned, by 10% of the 109 company plants, was 'restrictive labour practices' of indirect employees, or "inflexible division of work between operators and indirect employees." This was in addition to widespread demarcations commented on by other companies, and discussed also in the Donovan report.[72] In general, then, it has been widely accepted that British labour productivity is often lower than in the rest of Europe, or the USA, and to determine whether job redesign is likely to play any significant role in raising productivity, we need to look in more detail firstly, at specific industries, and secondly, at the economy as a whole.

Two recent reports on the car industry suggested that the various new forms of work organisation tried elsewhere in the industry, notably at Volvo and Saab, were unlikely to be utilised in the UK. The authors of the Rothschild, 'Think Tank' report on the car industry considered this to be the case on the basis of discussions with employers and union officials, and because of the costs involved (the new Volvo-Kalmar plant cost 10% more than traditional car plants).[73]

A National Economic Development Office report was slightly more equivocal, merely observing that under job redesign labour costs per unit output could rise, and that the phenomenon required further study before any recommenations could be made.[74] Finally, Rhys has pointed out that

whereas Volvo produced cars in small volumes for the luxury end of the market, with an average total production time per car of 9 hours, British Leyland, for instance is engaged in mass production of medium-priced cars, with an average product time of 2½ hours.[75] On this basis he concluded that Leyland was not able to afford job 'enrichment,' and would be unlikely to benefit even if it were.

Against these equivocal and pessimistic accounts must be set two reports produced from the trade union side. Pontarollo compared differences in effective working time between British and Italian car firms, that is, the length of the working day minus breaks, rest periods etc.[76] Increases in effective working time and thus of productivity he argued, could provide one method of securing the shorter working week, a stated objective of the T & GWU which organises the majority of British car workers.[77] One method for increasing EWT is to reduce break and rest times to a minimum, whilst another, recently embarked upon by FIAT, is to increase the flexibility of workers, and to reduce the length of the assembly lines in favour of small work group working. The latter initiative was welcomed by Pontarollo who urged unions to press for its introduction in other car firms.

Brown has described the struggles between labour and management, particularly in British Leyland, which have revolved around the production rate as determined by track speeds.[78] According to the union stewards, Leyland

management had been trying for several years to raise labour productivity, by intensification of labour. This was achieved both by increases in track speeds, and also, less successfully, by the use of Measured Daywork in place of bonus payment systems. Since the productivity of British car workers in 1973 was between 35 and 75% of that of their major competitors, it can be seen that there is a strong, economic necessity to raise labour productivity if the UK car industry is to compete on world markets.[79] Job redesign could play a role here, though whether it will remains to be seen.

A recent study of the coal mining industry argued that despite the widespread introduction of face mechanisation, output per man shift was still lower than anticipated, and part of the explanation lay in the poor rate of machine utilisation.[80] According to the author it was not uncommon for the automatic face cutter to be operating for only 2¼ of the 7¼ hours on each shift. In order to increase machine utilisation the author recommended that some of the lessons of the Durham composite longwall experiments, reported by Trist et al., might be adopted and applied elsewhere, since in his view there could be "no substantial increase in productivity without the conscious co-operation of the men," and the composite work method was one means through which such co-operation might be achieved. He also noted that the National Power Loading Agreement, of 1965, under which

payment was changed from an incentive to a flat rate system, appeared to have had the effect of reducing output, at least when not accompanied by mechanisation, which otherwise masked this reduction.

A study of the European chemicals industry, while noting that UK labour productivity compared 'favourably' with other European companies, nevertheless pointed out that in some respects Dutch and German plants had advantages over their British rivals.[81] One such advantage was increased flexibility of labour, whereby process workers might carry out minor maintenance duties, instead of having to await the arrival of trained maintenance workers. The report commented that,

> "Employees on the continent did not think their jobs were threatened by labour flexibility. Rather, they found it increased job satisfaction and their scope for initiative." 82

Again, therefore, it can be seen that elements of job redesign may appear in industries such as these.

More generally, Pratten, in a very recent article on 'The Efficiency of British Industry,' has focussed attention, on low labour productivity in the UK, which he conceptualised as 'overmanning.'[83] Some indices of this overmanning, or inefficient use of manpower, included the following:

> "..... machine operators may not be responsible for keeping their section of a factory clean (this work being done by cleaners); operators may not

> be responsible for checking the quality of the products they make, and this may necessitate the employment of more inspectors; operators may not be allowed to put right, or attempt to put right, faults in a machine or to set up a machine; specialist personnel may themselves operate demarcation rules.....84

The breaking down of these divisions, and the amalgamation of these work roles has been the distinguishing feature of two forms of job redesign - categories I and III. Insofar as demarcations limit the use of labour, and their corresponding elimination may raise labour productivity, then to that extent, job redesign may be said to have a future.

Another recent report on British industry made a similar observation.

> "The stage seems set for Phase Three of the Social Contract to include provision for a new round of productivity deals.....which (will) include... greater flexibility in the deployment of labour.. the gradual elimination of inter-trade barriers demarcation." 85

Such 'productivity deals' were extremely popular in the 1960s, but seemed to decline with the onset of recession and incomes policies in the 1970s.[86] Nevertheless there does appear to be a return to the concept, and the practice, as the above quote suggests. Chrysler UK, for example, recently announced a productivity agreement, one of whose provisions was to improve flexibility of labour within trades.[87] A report by the employment agency 'Manpower,' published in July, 1977,

suggested that few managers expected to increase production by hiring more staff in the near future, but many more hoped to achieve better utilisation of labour.[88] Finally, 'Personnel Management,'a major journal of British management, recently carried an article describing a productivity bargain, and extolling its merits.[89]

Finally, it should be noticed that many examples of category III redesign occurred in highly capitalised industries, and although labour costs are only a small proportion of total costs in such industries, they are more immediately amenable to adjustment.

Overall, the evidence presented in these few scattered reports and articles does not conform wholly to the view that job redesign is in decline. There may, as we have indicated, be situations where different forms of job redesign are likely to play a significant, though perhaps not a major, role in raising the productivity of British labour. As far as other countries are concerned, the difficulty of securing reliable information renders any speculation quite useless.

Further research on job redesign

The arguments that have been advanced throughout this thesis have several implications for the pursuit of further research, and these will now be outlined. Job redesign was conceptualised as a form of intensification of labour, a phenomenon in which labour productivity was raised by means of a greater expenditure of effort on the part of the workers

affected. Some of the problems with these ideas, and with the definitions of effort and intensity have already been discussed, and it became clear at that point that further resolution was dependent on further research. Few studies of job redesign have actually considered employee perceptions of effort in any systematic fashion, although isolated comments and observations appear to confirm the idea of increased effort expenditure as a feature of job redesign.[90] Future studies ought therefore to examine employee perceptions of effort, workloads, pace, and the effects of effort, such as tiredness, or fatigue. Employee evaluations of effort may not be found, empirically, to be isolated from evaluations of pay. In short, one may also need to assess perceptions of wage effort parity and disparity.

It has been suggested that perceptions of effort may depend on the actual and perceived origins of control over work pace, whether this be the group, the technology, or the worker himself and in certain forms of job redesign, especially category II, there are found transitions from paced assembly line working to individual working. On the other hand, it was argued that in these, and other situations, managerial control over the worker may be augmented because accountability would be easier to enforce. These arguments were inferential in character, and it would be useful to examine (a) whether the potential for better accountability was actually exercised by supervisory staff, and (b) whether workers themselves felt subject to greater surveillance and control. Equally, it would be useful to discover whether

the increased control over pace that is often a feature of job redesign, was recognised and valued by workers, and whether it was accompanied by, parallel, increases in other forms of control, for example, through the payment system or pay rates.

These suggestions would enable a more rigorous evaluation of the idea of job redesign as intensification of labour, although as indicated in earlier chapters there does already exist supportive evidence from a number of studies.

It was also argued that the provision of pay rises and/or pay incentives was a salient factor in worker motivation under job redesign, and that the factors responsible for motivation and performance were different from those responsible for worker satisfaction and improved job attitudes. Whilst evidence was adduced in support of both of these contentions, it is true nevertheless that stronger evidence would be desirable. On the relation between motivation and satisfaction, it would be useful to compare these factors amongst groups of workers which experienced job redesign both with and without pay rises. The problem here is that whilst there are countless, often sophisticated, measures of job satisfaction and job attitudes, and many concepts of satisfaction, the concept of motivation has received far less attention.[91] It was recently observed that the whole field of motivational theory was in a serious state of confusion, and this is reflected in the measuring instruments.[92] The Hackman et al. questions on motivation are useful, but there are few of them, and the concept has yet to be differentiated

in the way that has occurred with 'job satisfaction.'[93] More conceptual work may be required therefore before adequate measuring instruments can be devised and utilised.

Since some degree of importance has been attached to pay as a factor in raising productivity, it would be particularly important to examine changes in motivation where there have been no pay increases, and also, perhaps, where labour has not been eliminated, as this too was seen to be a potent factor in accounting for differences in productivity increases. And where labour was eliminated it would be necessary to examine the relationship between this process, and the increasing of productivity, to determine whether there was a causal connection, and if so, to specify its direction. Again it would be necessary to examine what mechanisms induced employees, under these conditions, to accept higher workloads as their co-workers were displaced. It may be that on this question, as well as on the issue of pay, one may need to introduce some notion of the perceived fairness of wages and workloads as a factor mediating between job redesign mechanisms and performance changes.

Mention of labour elimination brings us to the next point on which further research is required. In discussing the mutual interests of workers and employers it was suggested that the displacement or elimination of workers should be seen as a cost borne by the workforce. Now this may be oversimplified, and the degree of cost involved will depend

on whether displaced employees are found alternative jobs, and on the nature of those jobs. More research is needed to determine the fate of displaced workers. The other weakness in the section on mutual interests concerned the costs incurred by management, it being argued there were very few. Again, more research would be needed to examine immediate economic costs, such as lost production, or consultants' fees, as well as longer term costs, such as wage demands or labour turnover. In addition, there may be changes in the balance of power within a company following job redesign, and whilst it might be difficult to place a value on these changes, they ought at least to be taken note of. Finally, it would be useful to obtain more precise data on the distribution of benefits arising out of higher productivity, as between wages, profits, dividends etc.

The last point concerns management history. It was argued that job redesign could be seen as part of a continuous tradition of management attempts to raise the intensity of labour, but it was accepted, nevertheless, that there were also discontinuities in these practices. A much more detailed analysis of past managerial efforts to raise productivity will be required before an overall assessment can be made of the place of job redesign in the history of management practice. Such an analysis would have to focus on the various techniques used to raise productivity, including mechanisation, shift working, payment systems, method study etc., and would have to assess very carefully the degree to which these involved intensification of labour. A beginning has been made in this

direction by Brown, who has documented a number of productivity -raising strategies used by British employers since the last century.[94] Unfortunately, his work does not contain the mass of detail that would be required for the tasks set out above, and nor does it distinguish labour intensification with sufficient clarity from other productivity techniques such as method study.[95]

If research were to be pursued along the lines set out here, then we could begin to construct a much more accurate picture of the mechanisms, outcomes, and historical significance of job redesign, than has hitherto been available, and than is likely to emerge from within the current paradigms.

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1. MacGregor, D. 1960.

2. Hackman, J. & Lawler III, E.E. 1972, pp. 141-42. Herzberg, 1972, pp. 116-7; Birchall, 1975, p.xii; Emery & Thorsrud, 1975, p. 15; Daniel & McIntosh, 1972.

3. MacGregor, op. cit.

4. Schein, E. 1970, Chap. 4.

5. cf. Marx, K. 1970, Chap. 15; See also 1969, esp. pp. 15-20. Also Marx, K. & Engels, F. 1974, pp. 52-57.

6. Baldamus, W. 1961; also Baldamus, W. 1951.

7. e.g. Braverman, H. 1974; Gintis, H. 1976; Eldridge, J.E.T. 1971.

8. Emery & Thorsrud, 1975, p. 12.

9. den Hertog, F. 1974, p. 27. See also p. 29, ibid, for a similar complaint in another case.

10. Walton, R.E. 1974.

11. Locke, E. et al. 1976.

12. Hill, P. 1971.

13. Paul, W. Robertson, K. 1969, p. 39.

14. Aguren, S. et al. 1976, p. 28.

15. Nichols, T. & Beynon, H. 1977, p. 16.

16. Daniel , W.W. 1970.

17. Whelan, C.T. 1976.

18. Goldthorpe, J. et al. 1968.

19. Herrick, N. & Maccoby, M. 1975.

20. Walton, 1974.

21. Hill, P. 1971.

22. Davis, L.E. In Davis, L.E. & Taylor, J.C. (Eds.) 1972, p. 111.

23. Davis, L.E. 1972B.

24. Trist, E.L. 1976, pp. 81-2; cf. also Emery & Thorsrud, 1975, p. 15.

25. Herzberg, F. 1972, p. 117.

26. Roeber, J. 1975, p. 316.

27. Guest, R.H. 1957, p. 10; and Hill, P. 1971, pp. 72-3.

28. cf. Kuczynski, J. 1944, Chap. 2.

29. The discontinuity thesis is not confined to advocates of job redesign. Friedman, a Marxist economist, has also sharply contrasted what he calls the 'Direct Control' strategy with the 'Responsible Autonomy' strategy. See his 1977B esp. Chaps. 6,7. See also above, Chap. 5, and Kelly & Wood, 1978.

30. Marx, K. 1970, p. 386.

31. ibid, pp. 387-88.

32. ibid., pp. 393. cf. also on intensification of labour, in general, The Communist Manifesto. In Marx-Engels Selected Works. Vol. One. 1969,,p. 115; Marx, K. Wages, Price and Profit. In Marx-Engels Selected Works Vol. 2, 1969, p. 69.

33. See above, Chap. 2.

34. Phelps-Brown, E.H. (1959), 1965, p. 92.

35. Beynon, H. 1973, p. 24.

36. Quoted in Branson, N. & Heinemann, M. 1973, p. 95.

37. ibid., p. 95.

38. cf. Nyman, C. & Dunlop-Smith, E. 1934.

39. Brown, G. 1977, p. 308. See also Chaps. 14-16.

40. For ICI see Roeber, J. op. cit., for Shell, see Hill, P. op. cit.

41. Roeber, J. op. cit., pp. 329-31.

42. Marx, K. 1970, p. 322.

43. Owen-Smith, E. 1971, p. 212.

44. ibid., p. 23.

45. In Brown, G. op. cit., p. 334.

46. ibid., p. 336. More generally on productivity agreements, see Clegg, H.A. 1969.

47. Blackler, F. & Brown, C.A. 1975. Hackman, J.R. 1975A; Sirota, D. 1973B.

48. e.g. Davis, L.E. 1972C.
For a different view, see Mills, T. 1975.

49. Hulin, C. & Blood, M.R. 1968.

50. Reif, W.E. & Luthans, F. 1972.

51. Scott, R.D. 1973.

52. Imberman, A.A. 1973.

53. Penzer, W.A. 1973.

54. Fein, M. 1974.

55. Schrank, R. 1974.

56. Parke, E.L. & Tausky, C. 1975.

57. Frank, L.L. & Hackman, J.R. 1975.

58. Locke, E. et al. 1976.

59. Tausky, C. & Parke, E.L. 1976.

60. Fein, M. 1976.

61. Blackler & Brown, 1975. cf. also Blackler, F. & Brown, C.A. 1976, 1978.

62. Batstone, E. 1975.

63. Work in America. 1972. See Chap. 5 above for references to trade union critics.

64. Thackray, J. 1976; 1977; Leonard, R. & Rathmill, K. 1977.

65. See for instance Butteriss, M. 1975. Butteriss also lists 10 reasons why countries have become interested in QWL, which include full employment, rising expectations, rising absenteeism and labour turnover, growth in affluence, rising labour costs, more freedom of choice in work. All of these factors have, of course, been reversed, to varying degrees, by the present worldwide economic recession. cf. also Int. Council for QWL. 1976.

66. Braverman, H. 1974, pp. 86-7.

67. Keegan, V. 1976.

68. Jones, D.T. 1976.

69. Pratten, C.F. 1976A; also Bingham, J. 1977.

70. Pratten, C.F. 1976B.

71. See also Cairncross, F. 1977; and the letter by E.A. King, Director of the Institute of Practitioners in Work Study Organisation and Methods, Guardian, 28 Jan. 1977.

72. See Royal Commission Trade Unions and Employers' Associations. 1967.

73. Central Policy Review Staff, 1975, para's. 35-36.

74. National Economic Development Office, 1973, pp. 46-7.

75. Rhys, D. 1974.

76. Pontarollo, E. 1973.

77. cf. Jones, J. 1976.

78. Brown, G. 1977, Chap. 16. S ee also Beynon, H. 1973, Chaps. 5-7.

79. cf. Central Policy Review Staff, op. cit., Chap. 3 esp. p. 80.

80. Griffin, A.R. 1972.

81. Chemicals Economic Development Office. 1973.

82. ibid., pp. 19-20.

83. Pratten, C.F. 1977.

84. ibid., pp. 19-20.

85. Counter Information Services. 1977, p. 43; 'Productivity is keynote as new round of pay deal starts.' Guardian, 1/8/77.

86. cf. Cliff, T. 1970.

87. 'Chrysler deal to end restrictive working.' Guardian 22/12/77.

88. 'Gloomy outlook for executives.' Guardian, 4/7/77.

89. Jones, G.L. 1978.

90. See Chaps. 6,7,8.

91. cf. for instance Robinson, J.P. et al. 1969.

92. See Warr, P.B. 1976B.

93. Hackman, J.R. & Oldham, G.R. 1974A.

94. Brown, G. 1977.

95. A more useful, and detailed, beginning has in fact been made recently by Friedman, A.L. 1977B.

Part Five

CONCLUSIONS

CHAPTER 13 SUMMARY OF CONCLUSIONS

The main conclusions from the thesis may be stated as follows:

1. Taylor's theory of scientific management was shown to consist not only of a rational-economic theory of motivation, but to entail a thorough-going reorganisation of work and work methods. Where possible work roles and pay levels were to be individualised in order to counteract collective organisation and Taylor was quite aware of individual variability. More importantly, it was shown that enhanced division of manual labour was not an integral feature of Taylorism.

2. In general, job redesign has devised, or involved, no new means of raising productivity without increased effort expenditure. It consists of, and may be characterised as, a form of intensification of labour, in which working time within the working day is increased.

3. Historically, job redesign was said to have emerged principally in response to inefficiencies in production, rather than to 'personnel problems,' such as absenteeism etc., viz. unoccupied time and overheads (category I) ; non-productive and balance-delay time (category II) ; inflexibility of labour (category III).

4. The theory advanced in the thesis specified four mechanisms by which productivity and quality improvements could be obtained: pay rises and incentives, labour elimination and raised workloads, work methods improvements, and enhanced control and accountability. These mechanisms, in different combinations, were shown to have considerable explanatory power in categories II and III (above) but rather less in category I, particularly for white collar workers. It was suggested that the classical theories of job redesign might be appropriate for this small minority of the workforce.

5. The relationship between job redesign practice and scientific management practice was fairly complex, and varied according to the category of redesign under examination. Some instances of category I redesign, namely those which did not involve the work of decision-makers, supervisors etc., were analysed as consistent with the Taylorist search for "a full day's work," that is, for maximum intensity of labour. Other cases in category I, however, involved amalgamations of 'planning' and 'doing,' and thus went beyond Taylor's recommended divorce of these functions. Category II redesign was analysed as a pure form of scientific management, since it involved the individualisation of work roles, an increase in accountability and managerial control, the use of method study to raise productivity, and the use of

individual pay incentives. Category III redesign was analysed as a form of intensification of labour developed in conditions of product and/or process variability and uncertainty where it was difficult to assign regular, full workloads on an individual basis. Workloads were therefore assigned to a group, and productivity was raised by reduction of the work force or increase in work volume. This form of redesign was said to have discovered (by implication) the limiting conditions of applicability of certain Taylorist principles.

Theoretically, job redesign was said to have under-emphasised the economic basis of employment, and of worker - employer co-operation and conflict. Herzberg's job enrichment and task design theory also showed the individualism of scientific management.

6. These mechanisms were said to explain changes in job behaviour (productivity and quality changes) more than changes in attitudes. The latter were said to be responsive to a much wider range of features of the work environment, such as co-worker relations, supervision, physical conditions, pay, job content etc., and could, and did, therefore vary independently of changes in job behaviour. This distinction parallels the conceptual distinction between motivation (to perform) and job satisfaction. These distinctions enabled us to account for the many attitude-behaviour discrepancies found in the literature.

7. The notion that job redesign acts to the mutual interests of workers and employers was examined, and the evidence available did not unequivocally support the conclusion that the parties derived equal, or nearly equal benefits. For it appeared that the costs accruing to workers outweighed those borne by employers, e.g. loss of jobs, intensification of labour.

8. In the light of our analysis of job redesign as a form of intensification of labour, and of its affinities with scientific management, it was argued that the notion of job redesign as constituting a rupture or discontinuity in management practice, must be seriously questioned. And at the same time the argument that job redesign had no future was also shown to be erroneous.

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Errata

p.14 L.3, after 'In' insert 1955.

p.97. next to bottom line, 'structures' should read 'strictures'.

p.150, L.5, 'model' should read 'theory'.

p.282, Chapter 6 should read Chapter 5.

p.345, para.2, L.1, 'work output' should read 'effort expenditure'.